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ABSTRACT

Proceedings of a conference on Medical Education in the Contemporary World, organized by Dr. George E. Miller and sponsored by the University of Illinois in Chicago, September 13-14, 1976, are presented. American and foreign medical edu- cation experts considered the principal and recurrent problems confronting the field in a period of rapid social and technological change. Presentation topics and speakers included: (1) the problem of selection: Alfred Gellhorn, Robert Q. Marston, William J. Grove, and Arthur J. Snider; (2) the problem of program: Robert H. Ebert, Irving Schulman, Robert A. Chase, David D. Henry, and Fred M. Hechinger; (3) the problem of cost: Stanley S. Bergen, Jr., Roger J. Bulger, Mark Splaingard, John E. Corbally, and Alton Blakeslee; (4) America's role in medical education: John H. Bryant, V. Ramalingaswami, Tamas Fulop, and George E. Miller; and (5) a summary by Edmund D. Pellegrino. Biographical sketches are also included. (LBH)

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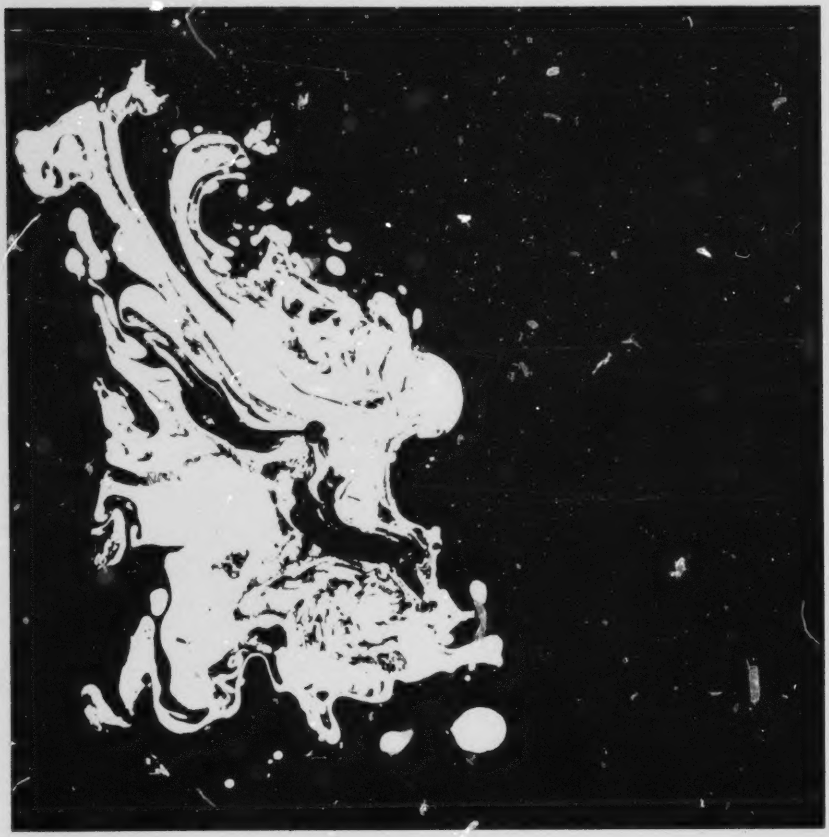

MEDICAL EDUCATION AND THE CONTEMPORARY WORLD

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MEDICAL EDUCATION
AND THE
CONTEMPORARY WORLD

Proceedings of a Symposium Conducted By
The University of Illinois College of Medicine

September 13-14, 1976

Chicago, Illinois

A Publication of the John E. Fogarty International Center
For Advanced Study in the Health Sciences

George E. Miller, M.D.
Editor

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
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FOREWORD

The Fogarty International Center for Advanced Study in the Health Sciences was established as a memorial to the late Congressman John E. Fogarty from Rhode Island. It had been Mr. Fogarty's desire to create within the National Institutes of Health a center for research in biology and medicine dedicated to international cooperation and collaboration in the interest of the health of mankind.

As an institution for advanced study, the Fogarty International Center has embraced the major themes of biomedical research, medical education, environmental health, societal factors influencing health and disease, geographic health problems, international health research and education, and preventive medicine. The Center has published the proceedings of the conferences and seminars devoted to these subjects.

The Fogarty Center is pleased to publish the proceedings of a conference on Medical Education in the Contemporary World held at Chicago, Illinois, September 13-14, 1976. The conference was organized by Dr. George E. Miller and sponsored by the University of Illinois. Under the skilled direction of Dr. Miller, a group of experts in medical education from this country and abroad considered the principal and recurrent problems confronting medical education in a period of rapid social and technological change.

Important issues have arisen as a result of social pressures for improved medical care. These pressures are felt in every country throughout the world, but they seem to be particularly acute in certain of the industrialized countries. This volume is directed to educators, scientists, administrators, and others who have a role to play in medical education and the delivery of medical care.

Milo D. Leavitt, Jr., M.D.
Director
Fogarty International Center

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SETTING THE STAGE

George E. Miller, M.D.

Thousands of individuals have gathered in hundreds of halls during 1976 to acknowledge our national heritage, to celebrate our achievements during the last 200 years, and to identify the problems we have yet to solve as well as the opportunities we have still to grasp. In the narrower framework of this symposium, we, too, would hope to acknowledge our heritage and to celebrate our achievements; but, more importantly, we will strive to identify the problems and opportunities medical education now faces in a contemporary world that is changing at an ever-accelerating pace.

Although distressing warnings were clearly evident in 1765, a prominent citizen of the community ended his commencement address at the College of Philadelphia with a reminder that "the present era will be ever memorable in the annals of history for the reputation of British valor and the success and glory of British arms, as well as distinguished by the reign of a King, the boast and joy of his people (under whose) auspices letters are cultivated, the arts flourish and the sciences are protected with a paternal air." Dr. John Morgan was the speaker; the topic, "A Discourse on the Institution of Medical Schools in America." Unlike most modern commencement addresses, that one was so persuasive that the trustees of the institution (which later became the University of Pennsylvania) took prompt action: They founded a medical school that established at the beginning of our Nation's history a university pattern for educating physicians in the United States.

Unfortunately that pattern did not long prevail. One hundred years later American medical education was instead a flourishing commercial enterprise that supported more than 400 medical schools (Chicago alone had 14 in 1910). Most were of dubious quality. They admitted virtually any student who could pay the fees charged by practitioners who had purchased their faculty chairs. These schools usually awarded a diploma to all who faithfully attended the full series of lectures, then almost the exclusive method of instruction.

The modern reform of medical education is generally attributed to the classic 1910 report written by Abraham Flexner. There can be no question of the importance of that document (which said among other things that "the city of Chicago is in respect to medical education the plague spot of the country") but contemporary medical historians, to the dismay of many liberals among us, are inclined to assign greater credit to the American Medical Association's Council on Medical Education whose efforts anticipated, then gave organizational legitimation to, the study which Flexner carried out with AMA encouragement. Whatever the forces responsible, the return of medical education to a university orbit began about the time of the Flexner report and was essentially complete by the end of World War II. With the massive infusion of Federal funds for research and research training which accompanied a postbellum expansion of the National Institutes of Health, the dominant medical faculty values and commitments shifted from those of professional practitioners to those of academic scholars.

During the same period another fundamental change began, that of adding postgraduate study to basic medical education. First, an internship year was grafted onto the collegiate program, a pattern that had become nearly universal by the end of the 1920's. In the 1930's residency training in medical specialties was appended and by the end of the 1950's this experience also was nearly universal. Today it is not uncommon for a young man or woman to begin an independent professional career in medicine at about the age of 30.

The scientific triumphs that medical scholars have achieved, coupled with the increasingly sophisticated techniques of medical specialists, have in the last generation transformed the practice of medicine as well as the content of medical education. Both seem to have become more academic, more hospital based, and more expensive. It is perhaps no wonder then that a question being asked with increasing frequency in all parts of the world is whether this orientation of medical education and medical practice addresses the most pressing health needs of either the industrialized or the developing world. As a more elegant speaker than I recently said, "If I were asked to compose an epitaph on medicine throughout the 20th century, it would read 'Brilliant in its discoveries, superb in its technological breakthroughs, but woefully inept in its application to those most in need.'" Marc Lalonde, visionary and pragmatic Minister of Health in Canada, put it even more bluntly when he said, "While an elegant heart transplant might prolong one life for 2 years, the risk reduction that could be obtained from achieving even a 50 percent rate of wearing seat belts would save 700 traffic deaths a year."

Whatever our emotional response to such observations, one of the things which critics point out is that medical care, or health care, is no longer the responsibility of physicians alone--if it ever was. The last two decades have seen a phenomenal increase in the number and variety of health professions and health occupations which, with the established health professions, are ideally envisioned as a team. But despite an array of talented individuals and groups, there is in practice a depressing absence of skill in true teamwork.

Inevitably this expansion in numbers and change in character and quality of health professions education, as well as health services, have been accompanied by a substantial increase in cost. But in spite of the enormous resources which America has mobilized for medical education and medical care, we still import more physicians than any country in the world. Last year roughly half of the newly licensed medical practitioners in America were educated outside the United States. As one sensitive writer from a rapidly developing nation has commented, while watching many of his countrymen settle here, "One country's transfusion is another country's hemorrhage." And while we import physicians, we export patterns of medical education and medical care which may aggravate rather than solve the health problems of the nations which take up our attitudes, values, and practices.

This then is the stage upon which our play will be performed for the next 2 days. The problems are obviously too large for medical educators, particularly academicians, to solve alone. We need the perspective provided by our universities at large, by others concerned with health and education, and by thoughtful and well-informed members of the public. Thus this symposium includes representatives of all those groups. We have provided a set of background papers upon which each of you has had an opportunity to reflect before arriving here. We have asked the major panel contributors to address the specific questions posed in those papers before dealing with others that may seem to them of greater importance. We have asked the media representatives to probe, to question, and to challenge in the journalistic tradition they follow so well. And finally, we have provided an opportunity for exchange both within the plenary sessions and in smaller groups that will encourage dialogue where the experience and expertise of others, who do not appear on this platform, may be shared. It is this exchange which we hope to assure by placing sharp limits on the time given for initial presentations and in the request that all symposium participants avoid making speeches on favorite, but not necessarily relevant, topics when they speak.

Background Paper

1. THE PROBLEM OF SELECTION

As a matter of policy, American medical schools (unlike schools in some other parts of the world) select those who will be admitted to the study of medicine from a consistently larger group of applicants. The magnitude of that selection process, summarized in Table 1, shows that for nearly 20 years the number seeking admission has increased more rapidly than have the first-year places available.

TABLE 1. Medical School Admissions Between 1948 and 1974.

Year	Applicants	Applications/ Individual	Accepted	Percent
1948-49	24,242	3.4	6,973	28.8
1953-54	14,678	3.3	7,756	51.8
1958-59	15,170	3.9	8,366	55.2
1963-64	17,668	4.0	9,063	51.3
1968-69	21,118	5.3	10,092	47.9
1973-74	40,506	8.1	14,335	35.4

The numerical issue is only one aspect of the selection problem. There is the further issue of assuring appropriate representation of special populations within the group admitted. For example, women in steadily increasing numbers are seeking the opportunity to pursue a medical career and are expecting to be judged according to the same selection criteria as men. The record for the last 35 years, as may be seen in Table 2, shows a pattern of flux.

Members of minorities also seek, and deserve, a greater opportunity to prepare for medical careers. Although comparative data are limited, those that can be cited (see Table 3) indicate a trend similar to that seen among women.

TABLE 2. Women Medical School Applicants
Between 1939 and 1974.

Year	Number	Accepted*	Percent
1939-40	632	296	46.8
1949-50	1,390	387	27.8
1959-60	1,026	494	48.1
1969-70	2,289	952	41.6
1973-74	7,202	2,743	38.1

*From 1929-30 to 1974-75 women in first-year medical school classes have increased from 4.5 percent to 20.4 percent.

TABLE 3. Minority Medical School Applicants
Between 1970 and 1973.

Group	Year	Applicants	Accepted	Percent
Black Americans	1970-71	1,250	642	51.4
	1971-72	1,552	810	52.2
	1972-73	1,786	791	44.3
American Indians	1970-71	44	--	--
	1971-72	79	--	--
	1972-73	121	29	24.0
Mexican Americans	1970-71	--	--	--
	1971-72	143	--	--
	1972-73	229	111	48.5

Quite apart from the question of ethnic grouping is whether those who are being educated for medical practice represent an appropriate distribution of socioeconomic class. Illustrative data on this question are shown in Table 4.

On the basis of historical trends over the last 45 years, a continued increase in medical school applicants can be anticipated through 1979. The number will then plateau until 1985, and subsequently fall to the 1973-1974 number by 1995. These projections are based on the observation that 0.63 to 1.08 percent of 22-year-olds have regularly applied to medical school (a much more consistent figure than the proportion of college graduates which has ranged from 2.8 to 6.6 percent). Since first-year places are unlikely to increase during the next 2 years at the same rate as applicants, competition for admission will predictably become even more severe.

TABLE 4. Percentages of Medical School Students.

	Caucasian	Black	American Indian	Mexican American
Annual Parental Income Over $20,000	36	8	3	5
Annual Parental Income Less Than $5,000	5	29	24	30
Father a Physician	17	9	4	7
Father a Professional	50	33	42	17
Father Unskilled	4	25	4	10

An increasing number of those rejected by American medical schools turn to other countries for the opportunity they have been denied at home. Although no comprehensive data are available, a conservative estimate is that at least 3,700 Americans were enrolled in foreign medical schools in 1971-197[illegible]. By 1973-1974 that estimate had increased to 5,000, and is still rising. A few of these students are later admitted to advanced standing in American medical schools but the numbers are small, as may be seen for the following years: 139 in 1970-1971, 162 in 1971-1972, 243 in 1972-1973, 169 in 1973-1974. Most return to the United States only after graduation, and with a large number of foreign nationals compete for internship and residency positions. Many foreign graduates, both American and others, subsequently remain in the United States to practice. Each year since 1970 some 30 to 50 percent of newly licensed physicians have been educated in and graduated from foreign medical schools. All of this suggests that the numbers now admitted to American medical schools (virtually all of whom graduate, since the attrition rate is now less than 3 percent and the academic attrition rate less than 0.5 percent) do not meet present quantitative demands for physicians in this country.

But what of qualitative factors?

Academically, American medical schools appear to get the cream of the college graduate crop, and that cream continues to become richer--at least in terms of college grade point averages (GPA) and Medical College Admission Test (MCAT) scores for science achievement and verbal aptitude--as Table 5 shows.

TABLE 5. Achievement of Medical School Applicants By GPA and MCAT.

	Admitted Students				Rejected Students	
	GPA In Percent		MCAT		MCAT	
	A	C	Verbal	Science	Verbal	Science
1953-54	10.0	21.1	519	530		
1958-59	14.3	16.0	527	523		
1963-64	12.3	11.6	537	545	484	467
1968-69	16.8	7.3	555	577	496	495
1973-74	36.4	4.8	567	592	518	524

In fact, studies of admission probability by the Association of American Medical Colleges have led to advice (in Medical School Admission Requirements) that, other things being equal, an applicant who does not have high college grades and high MCAT scores "should give serious consideration as to whether he or she should apply at all to . . . medical school."

The predictive validity for such a selection method is high when the criterion is academic performance in the first year. However, this criterion is increasingly attacked as incomplete. For example, one author points out that only half the students who excel in the basic science curriculum do so in the clinical program, and 70 percent of those who excel in the clinical program have not done so in basic science. In another study comparing minority students from disadvantaged backgrounds with regularly admitted students, all but one of the special students would ordinarily have been rejected on the basis of MCAT scores and college GPA. At the end of the second year in medical school, National Board Part I Examination scores still identified two populations, but the average for both groups was above the minimum passing level. In the final year the groups were still different, on analysis of aggregate performance on clinical services, but the difference had become the distinction between average and slightly above average students.

Finally, the predictive validity of these selection devices does not appear to be high when the criterion is success in professional practice. Despite the elusiveness of an acceptable definition of success, at least a few studies (Peterson, Cliute, Price) have attempted, and failed, to demonstrate a significant correlation between academic achievement and later performance. Academic records do, however, predict the nature of that practice: Those with lowest achievement have in the past been most likely to enter general practice, while those with higher grades are more likely to become specialists. Whether that pattern will persist in the face of a growing interest in primary care remains to be seen.

Thus, within this context, four questions need to be addressed during the symposium:

- Are we selecting an appropriate number of students?
- Are we selecting the right mix of students?
- Are we using the most suitable selection methods?
- If not, what alternatives are available to us: 1) open admission? 2) quota? 3) lottery? 4) preadmission clinical trial? 5) some other method?

THE PROBLEM OF SELECTION

Alfred Gellhorn, M.D.

Only in the last 25 or 30 years has it been increasingly more difficult to be accepted for admission to medical school. Many important policymakers in medical education, including some who make the rules for selection of medical students, would have little chance of acceptance if they were to try to enter medical school today with the kind of college record they had 30 years ago. I wonder if there could be any of them in this audience. Well, in any case, there is one and he has the floor at the moment. Maybe a feeling of guilt at the ease with which I entered Washington University with a mediocre academic record makes me particularly critical of the current criteria used in the selection of our doctors for tomorrow. My conclusion is that medical schools and their admissions committees are using irrelevant criteria which do select a considerable number of fine men and women; but this is by chance rather than by design. Of equal importance is the observation that medical schools are responsible for a miserable distortion of the college experience of one-quarter million or more premedical students who have profited little from their undergraduate education.

Although we proclaim ourselves a peace-loving people, we have had a war for every generation beginning with the War of Independence. Three of the four major wars have had an important influence on American medical education, and this is particularly true of World War II. At the time of the Revolutionary War, the first medical school in Philadelphia and its close second at King's College in New York had scarcely gotten underway when operations were suspended during hostilities. Afterwards there was general acceptance of the arrogant belief that the United States of America could do very well without any cultural, intellectual, or scientific influences from abroad. The one essential requirement to be a medical student was the money to pay the fees of individual lecturers; and then you could learn from Benjamin Rush about the wonders of bloodletting, purges, and emetics to relieve the inner tensions which produced so many diseases.

By the time of the Civil War there were more medical schools along the Atlantic seaboard, including Dartmouth, Harvard, and Yale. The first effect of these was an emptying out of the Southern students who never returned home. In the postwar period population growth and westward thrust created a demand for doctors which could not be met by university-related medical schools in existence at that time. There began then the mushrooming of proprietary schools, which reached the fantastic number of more than 400 between 1870 and 1910. These schools were clearly moneymaking ventures and admission as well as graduation with a diploma, often with little time between, required only the requisite money. The product was not spectacular but every one-road hamlet had its doctor and the ready access to care probably provided comfort to many anxious patients with self-limited health problems.

Before World War I, Abraham Flexner rocked American and Canadian medical education so that the impact of the song "Over There" was relatively minor. Mr. Flexner spent several weeks with the Johns Hopkins medical faculty, who had selected the best features of medical education in Britain, France, and particularly Germany, and then he ventured forth with the Hopkins model firmly in mind to assess U.S. and Canadian schools. Flexner's report in 1910 established the importance of scientific medicine through the integration of the basic sciences into medical education as fundamental to clinical medicine. The requirement of previous appropriate university or college education by those wishing to enter medicine was stressed. There were a number of additional factors such as full-time faculty, facilities for research, and continued clinical education in a teaching hospital after graduation. It came as no surprise to many when Mr. Flexner reported that the vast majority of diploma-granting medical schools were a disgrace and their graduates unqualified, but the public reaction was brisk, so that in less than a decade the proprietary schools had disappeared, and 50 of the 53 remaining schools had met standards established by the then liberal AMA and the fledgling AAMC.

The medical school curriculum consisted of 2 years of basic science followed by 2 years of clinical medicine, which was believed would produce physicians with a keen appreciation of scientific medicine. It is interesting that despite this rigid format, 80 percent of the graduates up until World War II practiced general medicine and only 20 percent were specialists.

World War II had a major impact on medicine and medical education. The success of Government-supported technological and war-related medical research was so impressive that the public insisted on the opportunity to purchase immortality during the postwar period. We in medicine did not disabuse the citizens and there followed the

20-year stream of gold from Washington to the medical schools. During this period the name of the game was laboratory and clinical research, and teaching and patient care were necessary evils. Appointments to faculty positions, as well as promotions, were tied to research productivity, and the rate of increase of graduate students in the basic medical sciences outstripped the growth of medical student enrollment.

The burst of biomedical knowledge was spectacular, such that publications in the medical and scientific journals appeared at the rate of one every 36 seconds. We should not be surprised, therefore, at the development of the concept that to understand the vast scientific advances and to contribute to the generation of biomedical knowledge, those who were to enter this flowering of scientific medicine must be possessed of superior intellect. Oh, appropriate lip service was to be given to character (Association of American Medical Colleges 1976), but this would be assessed during the interview after the applicant had passed the academic qualifications barrier reefs.

The obvious and most objective method to quantify intellectual ability and capacity, it appeared, involved the use of grades in college and medical "aptitude" tests, which made their first appearance in 1946. The college GPA (grade point average) has become a statistic of great importance to admissions committees, and particular attention is given to the GPAs in science courses. The MCATs (Medical College Admissions Tests) which cover verbal ability, science, quantitative ability, and general information are now standard, and the scoring on these and the college grades make up 66 percent of the decision on selection of candidates (Oetgon et al. 1971). Because the competition for medical school is so keen, the scores of the GPAs of accepted applicants have risen progressively during the last decade, such that in 1975, less than 5 percent got in with college averages below 3.0 (out of 4.0) and more than a third had straight A averages. Similarly, the mean of the four medical college aptitude tests has climbed, and applicants know that 600 (out of 800) or better in science and quantitative ability is necessary to assure serious consideration in most medical schools.

Before the predictive value of these grades is assessed, brief mention should be made of the impact of medical school course requirements and admission criteria on college education. More than 90 percent of medical schools require biology and chemistry through organic chemistry, one-half specify physics, and a third require mathematics, with calculus being specified in the majority of these. The only nonscientific subject explicitly identified as a prerequisite is English, which is noted by 75 percent of the 114 medical schools (Association of American Medical Colleges 1976). It is small wonder that the majority of premed students take science course after science course, and in each one their concern for high grades is an obsession. I have spoken to many college students who did not wish to go to medical school and they have made major efforts to avoid classes with premedical students because the competitiveness and preoccupation with grades militate against learning. The particular concern of medical school admissions committees with the performance of applicants in organic chemistry makes this a major battleground for interpersonal competition among prospective medical students. The resultant cheating, sabotaging of classmates' experiments, and other dirty tricks are common knowledge among college students and faculty, and were brought to the public's attention by Alton Blakeslee during this past year.

One cannot blame the premed student. He or she knows that 87 percent of the accepted applicants to medical school major in science, and the 13 percent who majored in such out-of-the-way subjects as history, sociology, political science, economics, or philosophy must have had something else going for them, such as playing the oboe well! It is bad enough that there is an overemphasis on science courses for those who ultimately are accepted by a medical school; for those who have faltered along the way because they failed to make a high grade in a science or, even worse, for those two out of three who have all the appropriate battle ribbons and then are denied admission, the effect is devastating. Their college education has not adequately prepared them for other health careers or even for good citizenship, and only a few enter graduate studies in one of the basic sciences. A few thousand who have wisely chosen rich parents go to the small number of foreign medical schools which still accept American students and where, for the most part, they receive a poor but costly education.

Medical schools, of course, believe that they cannot be faulted if so many wish to enter the noble profession, and further they have a public responsibility to select the most qualified applicants. The first question then is, "Do the college grades and the MCATs predict academic performance in medical school and in clinical or other situations requiring skills beyond the usual ones?" There is a considerable literature involving hundreds of medical students in many medical schools which demonstrates that the two major grade selectors (GPA and MCAT) predict accurately the grades students will receive in their first years of medical school. Thereafter, it is all downhill, so that the correlation between high and low GPAs and MCATs and the performance of these students in their fourth year becomes as small as +.01 (a perfect correlation is 1.0).*

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*The author singles out the following sources on the
(Continued on p.11)

There is slight variation depending on whether the GPAs in the last two years of college are used as predictors or whether individual MCATs are used, but none accurately indicates achievement in the clinical years. A review of the literature by Wingard and Williamson (1973) revealed no significant relationship between physician performance during the house officer period or inpractice and premedical grade criteria.

Interestingly, the performance on Part I of the National Boards and MCAT scores correlated well (Leif et al. 1965), and this, to me, is a less than flattering comment on the National Boards.

Having seriously questioned the mainstays of the medical school selection process, there still is the important interview for those who have passed through the apparently irrelevant but controlling GPA and MCAT screen. Surely the wisdom of seasoned faculty, basic scientists, and clinicians, will be able to discern those qualities which will eventuate in good students, good house officers, and good practitioners. To assess this judgmental process, it would be helpful to determine the goals of medical education as defined by the medical schools. Alas, such information is not readily available. I know of a number of schools which have the specific objectives of educating physicians to meet the identified needs of the States or the Nation. Among these are the University of Illinois, the University of Florida, the University of Missouri in Kansas City, Michigan State University and the University of Southern Illinois. In the AAMC (Association of American Medical Colleges) "Medical School Admission Requirements 1975-1976," 91 of the 114 medical schools do not list goals, 21 list only such general objectives as "basic foundation of knowledge for all aspects of medical care," "production of physicians who will pursue a lifetime of continuing education," and "learning about disease states in man." Several of the schools mentioned above note that they are selecting students who intend to practice in the State where they are located, and two schools indicate their goals of educating physicians for comprehensive care.

Despite the efforts of a few schools to relate their selection to the objectives of medical education, the

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(Continued from p.10)
subject of grade selectors as determinants of medical school performance: Bartlett (1967), Best et al. (1971), Conger and Fitz (1963), Donnelly et al. (1970), Echols et al. (1973), Gaugh et al. (1963), Gaugh and Hall (1964), Haley and Lerner (1972), Jason (1972), Korman et al. (1968), Leif et al. (1965), Oetgon et al. (1971), Otis and Weiss (1973), Pauli (1973), Rhoads et al. (1974), Scheuer (1975), and Wingard and Williamson (1973).

majority apparently consider their function to be the production of the "omnipotential" physician. In the few studies available, the interview appears to be as weak a reed as grades and MCATs in predicting the outcome of medical education. These studies correlated the interview with medical school performance, general competence at graduation, or clinical effectiveness as measured in internship and found values ranging from +.01 to +.21 (Echols et al. 1973, Eron 1954). An independent evaluation by psychologists of those accepted by interviewers revealed that successful candidates were healthy, robust, good looking, cheerful, good natured, and relaxed. The rejected were characterized as tactless, thankless, frank, pessimistic, unconventional, highstrung, coarse, and complicated (Holland 1973, Ingersoll and Graves 1966).

Perhaps it is not too surprising that the interview predicts little more than the personal preferences of the interviewer. With rare exceptions the interviewing process is not standardized, the interviewers are not systematically trained with a purpose in mind, the composition of the interviewing team is medical faculty and medical students, and the outcome of the interview rests on subjective weighting by the interviewer.

A final assessment of the results of the total medical school admission process as now practiced leads to two important conclusions: 1) The vast majority of accepted applicants graduate from medical school. A personality measurement suggests that about half are "non-normal" (Rockwell and Rockwell 1974, Rothman 1973), showing what has been described as a "normal" neurosis (Liske et al. 1964) known as the "medical student personology of the obsessional variety in which students make an adaptation that permits them to function in a rigid conforming fashion." 2) The admission process selects students who are more likely to be interested in science than in people. Daniel Funkenstein (unpublished monograph), who has been a systematic student of medical students, has summarized his 17 years of research on the bases of career choice. His grouping of students into "bioscientific" and "biosocial" types can readily be done at matriculation, but their ultimate careers are determined by factors other than personal characteristics. Among these are the post-M.D. training, type, and location; the geographic preferences of the spouse; the financial pressures and possibilities; the practice opportunities; and, of equal importance, the societal pressures. All except perhaps the last are self-explanatory, but the importance of the social pressures should be emphasized.

In the post-World War II period the rapid and extensive accumulation of new biomedical knowledge was one factor leading to specialization, but equally significant was the public attitude that a specialist was necessary for optimal medical care. This presumption, with its corollary of deprecation of the general practitioner or generalist, led to a reversal of the ratio of generalists to specialists from 80:20 in 1940 to 13:87 in 1972. Now the pendulum is swinging back and the demand for comprehensive, continuous, and personalized care in the form of primary care physicians has risen rapidly. Medical school admissions committees have changed but little and continue for the most part to select students whose personality and aptitudes are more relevant to careers as biomedical scientists, academicians, or specialists than as primary care physicians. Necessarily, however, a proportion will be forced by external circumstances into comprehensive care for which their character and training may be inappropriate.

As now organized, medical education appears to have little influence on subsequent career choices (Funkenstein unpublished manuscript, Rezler 1974).

Having indicted the selection system, I would like to place before you some suggestions for change.

First, each medical school should define the objectives of its education. These might range from the limited goals of educating primary care physicians for the underserved urban community, as in the program with which I am associated, to the production of physicians for a variety of careers including biomedical scientists, health care administrators, specialists, generalists, and so forth. For schools with the latter purpose, the faculty should have some concept of the proportion of each identified career that would be appropriate. During the past 40 years of my experience in medical academia, I have been privileged to be associated with five medical schools. In each, the faculty leadership solemnly believed that their medical school had the responsibility to produce the medical faculties of the future, whereas the other American medical schools would produce the practitioners. As I have visited other schools, I have found this conceit to be widespread, so that each institution sees itself as producing chieftains but no Indians.

Second, if medical schools defined their educational mission more precisely, they might be able to indicate the premedical requisites in a more rational fashion. This should be done in collaboration with undergraduate college and university faculties. I believe a core premedical curriculum could be devised in which mathematics, chemistry, and physics would be reduced so that they were contributory to an understanding of the basic medical sciences but no more. The overemphasis on chemistry, particularly organic chemistry, and on mathematics is unjustified in terms of their importance to the medical sciences or clinical medicine. Their distinction now is more that they keep down the number of medical school applicants than that they are vital bodies of knowledge. The core curriculum should include a significant segment of the social sciences which would foster an understanding of health and the health care system of our country. If possible, field experience should be provided so that students would have a means of testing their interest in medicine against reality. Finally, the importance of the humanities should be emphasized as a prerequisite to medicine, affording the prospective physician an awareness and sensitivity to diverse cultures.

Beyond the core prerequisites, variation could be encouraged. The student whose aptitudes and skills lie in research could concentrate on an area of science where experience in the laboratory could be gained. The community-minded individual could broaden his academic and people-oriented experiences in appropriate fashion, and so could others relate their interests to the varieties of careers which medicine provides.

Third, the selection of applicants should be on the basis of cognitive and noncognitive criteria. The academic entrance requirements should be set at a level which assures success in the medical school curriculum, but after that criterion has been met, the antecedent academic achievements should be given exponentially decreasing weight. The emphasis on facts which play such a large part in our current academic standards is palpably irrational as we know that the half life of these facts is less than a decade. A more appropriate testing for potential physicians would be in the area of problem solving, and I don't mean the manipulation of mathematical formulae. Since a physician is constantly faced with problems, it would appear more reasonable to ascertain the applicant's aptitude in this area. A variety of such tests are available but their applicability to medicine has not been determined.

The academic requirement having been met, major attention should be directed to nonacademic criteria. Again there is a large body of literature on various sorts of analyses which have greater or lesser correlation with future medical careers. It would appear useful for medical schools to develop collaborative research using personality, attitudinal, self-analysis and other forms of examination to acquire conclusive information. In the opinion of many, including myself, the best predictor of future activity is past performance. This is why the premedical requirements must be modified so that potential medical school students can have the opportunity to identify their area(s) of interest and skill and then apply themselves accordingly. There is need for much research to validate this concept, but such efforts are long overdue. For your possible interest I have included in the appendix the admissions process which is in use at the Center for Biomedical Education at City College.* As you can see, the academic and nonacademic criteria are carefully defined and quantified. A proportion of the applicants are interviewed. The interview form is standardized so that the same areas are covered with each student. The interviewers are trained and they are drawn from medical faculty, faculty from other disciplines, and nonfaculty personnel. An effort is made to have applicants interviewed by a majority and a minority interviewer.

The value of our selection process for predicting the future careers of our students is indeterminate at this time. We do believe, however, that a retrospective study will contain precise data on the basis for the selection of students and will enable us to draw conclusions regarding their relevance. The only aspect on which we have evidence to date relates to attitudes of our students compared to students at Columbia University College of Physicians and Surgeons and a national sample. There were many subjects on which there was a consensus such as ethical aspects of the care of terminally ill patients, emphasis on patient care, practice arrangements, importance of making money, and so on. The divergences appeared in type of practice (in which our students opted for primary care disciplines overwhelmingly), attitudes on medicare and its corollary, national health insurance (the City College students acutely felt the inadequacies of present policies), and, finally, their willingness to practice medicine on a salaried rather than a fee-for-service basis.

In summary, the common medical school selection process may be indicted on the following counts:

- The current use of and emphasis on grades are not predictive of medical school performance in the years of clinical education or thereafter.

- The failure to develop, test and use noncognitive criteria leaves to chance the personal characteristics of the future physician.

- The selection process distorts premedical education so that those accepted are not well prepared for medicine and those who have floundered on the way, or have been rejected, are not educated either for alternative health careers or for good citizenship.

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*Additional information may be obtained upon request.

It is suggested that consideration be given to the following proposed improvements:

- A definition of the objectives of medical education by each school and the criteria to be used in the selection of candidates for each category.

- A de-emphasis on science in premedical education and a concomitant encouragement of the social sciences related to health and the humanities.

- The development of methods for testing ability at problem-solving as one of the most relevant skills for a physician.

There are many signs that society is finding the medical profession too insensitive to health care. The emphasis on education for allied health professionals and the resurgence of faith healers are clear indications that traditional doctors are not meeting societal needs. Although it is recognized that medical schools cannot solve the problem, they are certainly a critical link in the chain. Reform in the selection process would be an appropriate beginning to demonstrate that American medical schools can respond with vigor and relevance to the needs of the day.

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Appendix

CENTER FOR BIOMEDICAL EDUCATION SCREENING AND ADMISSION PROCEDURES FOR THE CLASS ENTERING IN SEPTEMBER 1976

Introduction

The principles which will guide the consideration of applicants and determine the final makeup of the class of students entering in September, 1976, are unchanged from those used since the inception of the biomedical program three years ago. The two basic principles are (1) academic qualifications of applicants necessary to meet the demands of the curriculum, and (2) commitment of the applicants to the objectives of primary medical care for the underserved urban community. The procedures described in this document are elaborate and precise and are based on the actual experiences of the first three classes through two and one-half years of the curriculum. With the passage of each year the assessment of academic and non-academic qualifications will become more reliable as the evidence is strengthened by a larger number of students in the program and greater experience with the performance of students in academic and field courses. It is probable, therefore, that the procedures will be modified in succeeding years as the program gains an increasingly substantial data base.

Summary of Screening and Selection Process

I. PRELIMINARY SCREENING

Preliminary screens are applied first to the academic and then to the non-academic qualifications of each applicant. Only those applicants appearing to have some reasonable chance of success are considered further.

II. SELECTION FOR INTERVIEW

From the pool of applicants remaining after the preliminary screens, those judged to be best qualified are called for an interview. This judgment is based on two scores developed from the application file. These scores are the Academic (A) and the Social-Personality-Experiential-Commitment (SPEC).

III. THE INTERVIEW

Applicants called for interview constitute the final selection pool. Each such applicant is given a structured interview by two trained interviewers. A combined interviewing score (I) was assigned.

IV. FINAL SELECTION

Final selection is based on a single formula whose variables are A (Academic), SPEC (Social-Personality-Experiential-Commitment) and I (Interview). Those applicants with the highest scores are invited to enter the program up to the class size which can be accommodated.

Appendix (Continued)

CENTER FOR BIOMEDICAL EDUCATION

Admissions Interview Format - 1976

Interview Areas

I. The impact of some significant health or community activity on the applicant's development.

II. The relationship of the applicant to his or her school. Has school been a challenging experience? Has an extracurricular activity provided leadership opportunity?

III. Discussion of the moral and monetary commitments. What enables the applicant to make such a commitment at this age? (Be gentle.) What alternative career might you choose? Why has the applicant selected general practice?

IV. How does the applicant spend a typical day? Are they prepared for the long work day at the Biomedical Program? How does the applicant integrate a heavy academic load with those activities necessary for personal development?

V. Exploration of a special area expressed in the essay. Can the applicant bridge the gap between thought and action?

VI. Extent of the applicant's knowledge of neighborhood problems. Is the applicant aware of any neighborhood social institutions which affect the quality of life?

VII. Has any national or local event been important to the applicant's career choice?

VIII. Maturity. What serious problem has the applicant resolved in the past year? (Don't arouse paranoia!) What are your responsibilities within your family? Has an employment experience taught you any new things about working with other people?

IX. Do you have any serious health problems?

At the conclusion of the interview the applicant should be encouraged to ask questions about the Program.

Appendix (Continued)

CENTER FOR BIOMEDICAL EDUCATION

Interview Score - 1976

Name of Applicant: ______________________________

Date of Interview: ______________________________

I. Non-Academic Experiences

1) Did the applicant's discussion of the non-academic area of the admissions application indicate that he or she had grown as a result of the activities reported in the application? _____

II. Awareness of Community Problems

1) What is the extent of the applicant's knowledge of and appreciation for the serious problems in his or her own community? _____

III. Commitment to the Goals of the Program

1) Does the applicant have an understanding of the importance of general medical practice? _____

2) Is the applicant strongly committed to the concept of providing medical services in those areas where it is most urgently needed? _____

IV. Overall Assessment

1) What is your estimate of the maturity and seriousness of this applicant? ______

Score each question from 1 to 10

3 = below average
5 = average
7 = above average
9 = outstanding

Interviewer's Signature ____________

THE PROBLEM OF SELECTION

Robert Q. Marston, M.D.

The unending debate in democratic societies is the balance between the rights of the individual and the needs of society. Throughout most of our history, education has served both goals in an even-handed and, indeed, a mutually reinforcing fashion.

First, for example, the American classroom acted as a means of integrating millions of new immigrants and making individual advancement possible. Second, the land-grant movement served well the agricultural and technological needs of the Nation even as it made the benefits of higher education available to much broader segments of the population. Third, the G.I. bill of rights was aimed toward several purposes, such as the effective relocation of returning veterans, the goal of replenishing deficiencies in trained manpower which developed during the war, the provision of a reward for service in defense of the country, and a significant enrichment of individual lives.

However, in more recent years, as the goal of universal high school education has neared reality, more and more complex questions have arisen, especially about who should be selected for postsecondary education and under what conditions. We have seen a withdrawal from free tuition, a requestioning of open access to higher education, a review of the relative cost to be borne by the individual and the state, and at the same time we have renewed attempts to match more closely the job market with educational output regardless of individual aspirations.

There are three aspects of the selection process that are of particular concern to me: 1) public frustration, 2) student confusion, and 3) social purpose versus the rights of the individual.

Public Frustration

The problem of public frustration is a growing one. In spring 1976, a bill was introduced into the Florida Senate with 26 cosponsors out of a total of 40 senators. The bill proposed the following:

> The Board of Regents shall require the universities to select students for admission to postbachelor degree programs as follows:
>
> 1) Twenty percent of the students admitted to each postbachelor degree program shall be selected based on competitive academic standards established for that program.
>
> 2) Eighty percent of the students admitted to each postbachelor degree program shall be selected from those remaining qualified applicants by a random selection sequence established by a drawing. Inclusion in the drawing shall be limited to those applicants who have achieved an undergraduate grade point average of at least 3.0 on a 4.0 system for the best two academic years, and who either have performed at least at the 50th percentile on the testing instrument approved by the board for each program, or who have favorable evaluation of experience factors such as: undergraduate major field of study; postbachelor academic accomplishments; military, work, and other maturing experiences; extracurricular activities; community service; and other selected assessments of ability and motivation.

The initial reaction was one of disbelief and even ridicule. In fact, I was reminded of a story a friend in the State Department told me a few years ago.

One of the Department's several think tanks was hurriedly assembled to discuss this Nation's response to Sputnik. Scientists, military experts, political experts, industrialists, and, even in those days, informed representatives of the public debated the possible damage to our image and possible shifts in the delicate balance of world power.

Finally, in what must have been deep frustration, one of the members stunned the others by almost shouting, "Why don't we shoot it down!"

Absurd. Yet, as the story was told to me, the group soon moved back to the thought that the development of the ability to do just that (to "shoot it down"), however poor the motivation or however awkwardly stated, was the central issue.

Last year, I stood at the Cape and watched the launching of the joint USSR-USA Apollo-Soyuz flight and recalled this little story.

But I thought about it also when I read the Florida Senate's proposal to "shoot down" the admissions process. All of the reasons not to pass the bill were marshaled--loss of accreditation, the injustice of knowingly accepting less qualified students, the uncertain comparability of grade point averages from different institutions, and so forth. In the end the bill was not brought out of committee.

However, tne relief at the ultimate outcome has to be measured against the force of deep feeling expressed by the fact that 65 percent of the senators in a capable and responsible legislature were willing to cosponsor an admittedly defective bill.

There is a deep-seated sense of resentment and frustration, not only in medicine but in many other areas where selection is restricted to a fraction of those who are fully qualified.

No other single item is brought as forcibly to members of governing boards and senior administrators as the question of selective admissions.

Yet, among the most highly competitive areas of veterinary medicine, law, and the more popular graduate programs with high national reputations, medicine stands out in several ways. First, admission to medical school has been highly competitive since shortly after the Flexner report in 1910. Then, there is considerably more emotional reluctance to choose other than the best qualified physician than, say, a second-rate lawyer. While familiarity with the problem over a longer time and sensitivity to choosing less than the best qualified person have countered some of the frustration, on the other side is a growing bafflement over our use of markedly less qualified foreign medical graduates, the apparent sequestration of bright young physicians in areas and specialties of lesser perceived need in medicine, and the higher financial rewards to physicians. The cry "But I would want to practice in __________ for a modest income" sounds increasingly convincing to many as a reason to select an academically less qualified student.

Student Confusion

The question of growing selectivity and uncertain or wavering estimates of employment needs (note the ebb and flow in engineering over the years) in increasing numbers of professional fields constitutes a core problem in higher education. One aspect of that problem is confusion among students.

In the current job market, with few exceptions such as accounting and the health professions, we are constantly asked to justify educating at public expense individuals whose skills are not needed, at least not in the current economic climate. Schools of education are especially vulnerable now as the last of the "baby boom" students prepare to teach the decreasing numbers following them. It has been difficult to sort out the benefits of downward pressures on colleges of education, since the ultimate result may be only to move more bodies to the colleges of arts and sciences. These games of musical chairs, in which one after another professional "chair" is removed, cause great confusion among students.

What is the basic reason for a college education--career enrichment or life enrichment?

Do too many people go to college and for the wrong reasons?

Can we ever really come to grips with the basic fact that there are too many people for the world, for the United States of America, for everything?

The question of selectivity and admission to medical school is the clearest example of dedicated and qualified young individuals experiencing an unreasonable block to a goal pursued with care and effort over many years. However, the greatest impact in changing the climate on campuses has been the large number of students with basic qualifications who find that even their second or third choices may not be available. Added to the confusion associated with the selection process is the increasing prospect that completion of professional education may well be followed by a lifetime of under-employment.

The students on our campus are more serious, harder working, and not unlike the students who returned to the campuses after World War II; yet they are a bit fearful about the future. These students are younger than the post World War II students and less mature. One hears more disturbing stories about cutthroat competition, greater incentives to cheat, and a harshening of attitudes because of the stakes involved. These concerns have stimulated responses. Our preprofessional groups are focusing more sharply on the adverse effects of over competition. There is a stronger student-faculty commitment to find ways to minimize cheating. There is a major program on our campus to relate the humanities more meaningfully to the several professions.

The bottom line for students, however, is an uncomfortable level of confusion as they do well in college only to find roadblocks in the job market, in additional educational opportunities, and in their search for sound advice. Such conditions constitute potential social dynamite.

It is notable that the Council of Student Body Presidents in Florida's State universities supported the senate proposed lottery bill by a vote of 7 to 2. The council unanimously urged a study of admission policies for all graduate education.

Social Purpose Versus Individual Rights

No aspect of selective admissions raises a more profound and basic question than that which I alluded to at the beginning of my remarks, the rights of the individual versus the needs of society.

Two years ago in India I met the first member of the "scheduled castes" to be headed for a department chairmanship in the All India Medical Institute, a world quality medical research and educational institute. At that time he was the best qualified person for the job. Only a few years earlier, however, he had been plucked from a heritage of centuries of village latrine cleaning, the lowest of the low, and given precedence over other of his peers.

I began this paper by pointing out three instances when education has served the needs of individuals and society in a mutually reinforcing fashion, that is, the waves of immigrants coming to our shores, the land grant movement, and the GI bill.

Some who know of my long-term interest and involvement in the problems of blacks in our Nation might wonder why I did not include the civil rights movement of our times as a fourth example. Myrdal's An American Dilemma correctly saw the future of America and the rights of American blacks intimately intertwined. Education, primarily at the elementary level but actually at all levels, has been the main tool for achieving social and individual goals. Much has been accomplished; much remains to be done.

In the narrow sense on the subject of selection, the dilemma of historically disadvantaged minorities and women and the socially and economically disadvantaged fit almost equally well under the "mutually reinforcing" label, or, as I have chosen, the polarizing label of "social needs versus individual rights."

Our society has determined the need for greater representation of such groups in professions and other areas of leadership than will be achieved readily by strict measurement by conventional assessment of merit. By Florida Board of Regents' rule we admit up to 10 percent of students from disadvantaged backgrounds who are deemed to be capable of the required work but who fail to meet competitive standards set for the other 90 percent of enrollment.

This policy is uniformly applauded when all can be accommodated, supported generally when competition is gentle, and is a source of growing concern in such volatile areas as medicine and law. Some have deplored the fact that the Supreme Court shied away from the issue in the DeFunis case concerning the rights of a Phi Beta Kappa white student who was initially denied admission to a law school to which less academically qualified minority students were admitted. However, a case can be made almost equally well that 1) society is best served both by unleashing latent talent among historically underutilized segments of our people and by choosing the most talented to foster, or that 2) the question of basic individual rights favors either the brightest scorer or the one in second place because of past oppression. Thus, it may be well that we work through this complex issue rather than seek a speedy and necessarily imperfect answer, realizing the difficulty in explaining to unsuccessful candidates why individuals with weaker qualifications may be accepted.

The other area I have selected to discuss under social and individual needs really has to do with the allocation of public resources.

While it is clear that a nation would be unwise to support the expensive education and training of astrophysicists in numbers greatly exceeding the tools necessary for their work, for example, celestial telescopes, it is not at all clear where the dividing line between individual educational goals and perceived national needs should lie. Margaret Mead pointed out to our students recently that, with current life expectancies, they should consider the probability of three or more careers, not one, in a lifetime. This view would place less emphasis on the perceived specific quantitative needs of society and more emphasis on the qualitative needs for well-educated citizens and on the aspirations of individuals to develop skills, attitudes, and understanding which are transferable across fields of employment.

As one who has struggled almost from the beginning of national debate on the health manpower needs of the Nation, I would welcome some shift away from our preoccupation with elusive workload projections as the basis for health educational policy. In all candor, however, I believe the tide runs in the other direction. At both the Federal and State level, in health and in other areas of education, the trend is to purchase a product with tax dollars and to match more closely those products be they physicians, engineers, or teachers to the job opportunities actually available. This trend not only will continue but will be a useful and even necessary step in meeting the marked changes I shall now attempt to summarize.

Conclusions and Summary

I have reviewed briefly and factually three problem areas of selection. What should be done? The answer is, I think, a great deal. Winners have been happy and losers have wished they had won since the world began.

Yet the degree of public frustration, student confusion, and polarization between social and individual needs is indeed social dynamite. These problems exist today at a sufficient level that we simply must do a better job in terms of the following:

- Defining reasonable criteria for selection.
- Communicating these criteria more effectively.
- Adhering to criteria once they are established.

While I see little need for a drastic overhaul in the basic selection process under the circumstances of 1976, a word is required about the near future. The postindustrial society is not something in the future. We live in it today. The lag is in the reordering of our lives, our values, and our society to the changes which have already occurred.

Project Independence does describe accurately the type of definitive central planning required in the production and utilization of energy in the future.

The controversial Limits of Growth does carry a clear central message of inevitable constraints on our actions.

The recent book from the Manpower Institute, Boundless Resource, urgently prescribes a new relationship between work and education.

It would be most strange, indeed, if the conditions of the new world we have recently entered did not drastically affect every aspect of our universities, including the selection process.

Finally, I have been asked to comment specifically on four questions.

First, are we selecting an appropriate number of students? I stopped playing this game a long time ago. In the fifties and sixties the only answer was "more." Today, the answer has to be "it depends." It depends primarily on the type of national health insurance we have or don't have. Without that decision, the short-term answer is that the present numbers are probably about right. But, there is no way one can arrive at an estimate of the numbers needed when one has not really come to grips with the question, "needed for what?"

Second, are we selecting the right mix of students, by which I infer the right mix of men, women, minorities, those with differing career goals (of which specialty versus general practice is the easiest shorthand), those with exceptional academic talent, and those with other desirable qualifications. I think the answer has to be that we are not now selecting the right mix, but rather use a narrow band of criteria for admission.

Third and fourth, do we have suitable selection methods and, if not, are there alternatives? I think we have better election methods in the health professions than in any other area in the university. It would be hard to think about many other disciplines in the university even talking about the problems of selection as we have today. I believe they're far behind in identifying the problems of selection and rely as heavily on academic achievement as we do. One problem about which we must do a better job is being sure that alternative pathways are not eliminated for those who are unsuccessful. There is a real danger that our present selection procedures, plus the economic conditions which now exist, could lead us to withdraw from the effort to increase availability and accessibility of medical education to a much wider segment of society. It would be tragic if we allowed these factors to limit access to medical school to those who come from the more financially secure segments of our population.

THE PROBLEM OF SELECTION

William J. Grove, M.D.

The four questions to which this portion of the symposium has been asked to address itself are in many ways interrelated to an extent that makes it difficult to respond to one question without establishing a set of assumptions that fixes the response to subsequent questions. For example, in my view, the appropriate number of students can be a function of generally agreed upon physician to population ratios, or the appropriate number could be a function of a clearer definition of the role of the physician in the health care system. If that role is defined, the type and number of students best suited to fit that role might in turn also be determined and the method of selection tailored to identify a particular type of individual to carry out the predetermined role.

Despite the problem of one response imposing constrictions on subsequent answers, I shall attempt to address the four selected questions with the confession that the ensuing comments are the opinion of the speaker, based upon 25 years of experience as a member or chairman of the admissions committee of one medical school. I suspect we might all agree that admission to medical school is tantamount to admission to the practice of medicine because of low attrition rates. Admission committee members often lose sight of the fact that they are selecting future practicing physicians rather than medical students.

But to the first question: Are an appropriate number of students being selected? Whether or not an appropriate number of students are being selected should, in my opinion, be determined by the function that we assign to physicians in the health care delivery system.

Although one must acknowledge that specialization in medicine is a phenomenon that may well continue into the decades ahead, I believe the role of the physician should not be limited to that of a specialized technician. Recent past trends of behavior of physicians force one to conclude that physicians are becoming more and more oriented toward highly specialized tertiary diagnostic and therapeutic techniques and that other health care professionals are assuming the role of interpreting for patients their disease, or their diseases, and the meaning or purpose of diagnostic and therapeutic procedures being applied. Many of the physicians I know seem to have decreasing interest in preventive medicine and in the detection of disease in its early stages. These roles seemingly are being left to others. Clearly, I reject a limited technical role for the physician. I believe medical schools must reverse the trend that would limit the role of the physician. A broad role for physicians will continue to require an output of physicians at least equal to our present output for many years to come.

Some may say that I long for the good old days of the general practitioner. Perhaps I do, but I suggest that anyone who has been a patient subjected to the situation of attempting to interface with literally scores of health care professionals also yearns for someone to put his illness and its therapy into perspective for him. I contend that most of us want the most experienced and most highly educated member of the health care team to assume that responsibility. We must not limit the output of physicians lest this important task by default fall to others.

I respond to the question of whether we are selecting the proper mix of students with a categorical "No!" regardless of which aspect of "proper mix" we wish to discuss, and several aspects of the expression "proper mix" do come to mind. For example, do we admit to the medical profession the right mix of individuals with humanistic interests as well as scientific interests? Do we have a mix of students that reflect the various socioeconomic strata of our society? Do we admit the right mix of students of varying academic achievements? A corollary question comes to mind: Must all physicians have had a premedical record of B or better? Also, do we admit the right mix of students from various racial and ethnic groups? The United States, it seems to me, is unique among the nations of the world since it is almost the only country where there are large numbers of individuals with varying racial and ethnic backgrounds. By contrast with most nations of the world, ours is racially and ethnically a heterogenous society--a heterogeneity that has caused many problems in the medical school admissions process.

Obtaining a mix of students from various socioeconomic strata, quite independent of the racial and ethnic mix, remains a major problem. By far the largest percentage of students in United States medical schools today are from the higher socioeconomic levels of our society.

In the past few years many schools have attempted to select students with broad humanistic qualities and cultural interests but the major criteria by which students continue to be selected is prior academic performance in certain selected scientific areas. Until admissions committees begin to admit large numbers of students using criteria in addition to achievement in scientific courses, the mix of students and the type of physicians ultimately produced will not change.

In my view the selection methods in current general use should be greatly modified because, as I have already indicated, I believe we should be educating physicians with a deep appreciation of humanistic and cultural values as well as scientific values. I believe the present process of selection tends to create a homogeneity that is not representative of our society nor does it yield a group capable of responding to the needs of our society as society perceives them.

Selection committees behave as though all students admitted were to become faculty members and scientists. In fact, no more than 15 to 20 percent of any medical school's graduates become academicians. On the average, at least 90 percent of all graduates become practitioners in some setting. The selection process should be geared to single out those individuals who will be sound practitioners--not academicians. In a society that is perceived by many as becoming increasingly dehumanized, medical education should take the leadership in developing humanistic qualities in those individuals it educates to carry out a distinctively special and personal role in society.

Recently the University of Illinois College of Medicine completed a study of how it might best evaluate the noncognitive attributes of applicants. A faculty group has recommended that a carefully controlled interview process be undertaken in an effort to be more objective in ascertaining these qualities.

Having said that the present selection methods need improvement, I must offer some suggestions.

As far as I am able to determine, there are really only four ways by which individuals can be selected for any task or position. They may be selected by merit, by privilege, by chance, or a combination of any of these categories. The selection of individuals for admission to medical school is no exception to these general selection methods.

The merit method has come to imply objectivity in selection. Certain instruments of measurement believed to be predictive of future academic performance are used. Committees come to put great reliance upon the results of these tests, heavy reliance that tends to relieve the committee of responsibility for making judgments on softer, noncognitive information. Recently litigious activity has tended to strengthen the use of these "objective" criteria.

The method of selection by privilege includes not only the advantage given to certain individuals because of socioeconomic status and parentage, that is, children of alumni or financial contributors, but also the advantage afforded under certain circumstances to students from defined geographic areas or from certain races or ethnic groups. Also included in this category of selection is the privilege conferred upon some political officials to appoint individuals of their selection, often based upon friendship or political persuasion.

Chance or random selection has not been widely used for identifying students to be admitted to medical school. It would appear, however, to be the most democratic and fair of all selection methods. I am aware of only one experiment with respect to selection for medical school where the random selection method has been used.

As often as not the merit method and the privilege method are combined even though most medical schools in the United States believe they apply solely the merit principle in their admissions processes. The GPA (grade point average) and MCAT (Medical College Admissions Test) are used as measures of prior academic achievement and as fundamental bases for selection. However, these are often modified by factors of privilege, geographic areas of origin, parentage, and so forth. Thus, although we often delude ourselves into believing we admit only on the basis of merit, we in fact modify the rigid merit process by geographic, racial, ethnic, parental, and economic considerations.

Medical schools rarely if ever find it necessary to bow to political pressure, and none has a system where politicians mandate candidates from among a qualified pool as is done for appointment to the service academies.

The random selection method has great appeal for me. My attraction to the random selection process for admissions is based upon some assumptions. First, I believe most who seek to be admitted to medical school are highly motivated. The motivating factors may be purely selfish, purely humanitarian, or, realistically, something in between. Whatever the basis of motivation, however, I believe most of us would agree that those seeking admission to medical school are highly motivated--perhaps one should say, highly self-motivated.

Second, I assume that any motivated student with an average MCAT and a reasonable GPA--let us say 3.0 or better on a 5.0 scale--can succeed in medical school. This assumption is based upon some experiences I shall report in a moment. Third, I assume that there has not yet been a demonstration of a correlation between premedical and medical school achievement and the quality of the practice of medicine. And, fourth, I assume that no more than 15 percent of the total annual national output of physicians can or should be recruited into academia.

Several experiences over past years at the University of Illinois would suggest that students with wide ranges of grade point averages and MCAT scores at the time of admission can all succeed in medical school and go on to become practitioners. About 4 percent of the University of Illinois College of Medicine graduates enter and remain in academia.

Since the early 1930s the University of Illinois has been required to admit students from Cook County and non-Cook County areas of the State proportional to the relative population of Cook County and the remainder of the State. Until recently the average of the non-Cook County group grade point averages has been below that of the Cook County group of students. Yet there has been no significant difference in attrition rates between the Cook County and non-Cook County groups when viewed over a long period.

Beginning in the early 1950s a select group of students from rural areas of Illinois has been admitted on the recommendation of the Illinois Agricultural Association-Illinois State Medical Society in exchange for their promise to these organizations to remain in a rural area for at least 5 years after graduation. Nearly all of these students had prior academic records, as measured by the GPA and the MCAT, substantially below that of the average of the remainder of the class that was admitted. Yet, on the average over the years, the attrition rate among this group has not been statistically higher than those admitted through the regular process. All have met one of the criteria for graduation--passage of National Boards, Parts I and II.

During the past 8 years, the Medical Opportunities Program for minority group students has provided an opportunity to observe a group of students with prior academic performance lower than the average of all students admitted. Although a number of these students have taken more than the usual time to meet the requirements for graduation, and although there has been a higher attrition rate, the program has contributed significantly to increasing the number of minority physicians--physicians who would not be in practice had academic merit been the only criteria. The point is, most of these people made it!

All this seems to suggest that given motivation of students admitted to medicine and given students with a reasonable prior academic performance, success in medical school can almost always be achieved.

Gradually, almost every factor that at one time or another had been used to restrict the size of the applicant pool is being eliminated. Federal law prohibits discrimination against applicants because of sex, race, color, creed, age, and, most recently, physical and mental or psychological disability.

I am persuaded that the random selection method would essentially eliminate admissions problems related to allegations of discrimination and that students so selected would succeed. However, a random method of selecting potential practitioners of medicine raises a sticky issue--that of public acceptance. At least our academic community and probably a much wider segment of our society is rooted in the tradition of the merit principle of selection, no matter how badly the system may be distorted. Before a system of random selection could be implemented, a public education program demonstrating its desirability would be required. The target of such an educational program would necessarily include the media, legislators, faculty, students, and others.

A random selection system of admissions might be developed as follows: The medical school could define the parameters of the applicant pool from which students would be randomly selected. For example, a school might require a minimum GPA of 3.5 on a 5.0 scale, an average MCAT above the 40th percentile (that is, equal weighting of all parts), a baccalaureate degree, and an acceptable level of performance on a series of interviews directed toward determining noncognitive characteristics of the applicant, or some other scheme for assessing noncognitive characteristics might be used.

Once the pool was established, the class would be filled by random selection.

I suggest that the effect of such a program might well be the modification of student behavior vis-à-vis selection of college curricula. If it is perceived by applicants that noncognitive attributes and a knowledge of the social sciences and humanities are seriously being considered in addition to knowledge of the basic sciences, the characteristics of the applicant pool might shift dramatically. The competitiveness for "grades" might decline and students might actually seek an education, since their chances of admission with a C+ or B average would be the same as the student who gets all A's in science courses.

The Netherlands has used random selection for 5 or 6 years. A review of their experience after a few more years will be interesting.

I conclude: 1) that the output of physicians should not be decreased, 2) that greater attention must be paid by medical schools to ways of admitting more broadly educated persons and of eliminating discrimination on any basis, 3) that our present system of admissions tends to limit our ability to fulfill these objectives, and 4) that a system of random selection might provide a means of helping to solve some of the problems now plaguing the admissions process.

As I make these, perhaps, nonconforming suggestions, I am not unmindful of Machiavelli's warning: "There is nothing more difficult to carry out, nor more doubtful of success, nor more dangerous to handle than to initiate a new order of things."

THE PROBLEM OF SELECTION

Critique and Challenge

Arthur J. Snider
Discussion Initiator

Mr. Arthur J. Snider: As a newsman my task is to ask some objective questions; but I would like to begin, as a layman and a consumer of medical care, with several subjective comments.

I think the three speakers were most perceptive in outlining the painful problems that confront medical educators as they strive to find an equitable method of selecting among meritorious applicants while balancing social purpose against the rights of individuals. But I am far less sure that we have heard from them a clear-cut operational solution. When Dr. Marston noted that a lottery method had been suggested in Florida and Dr. Grove said he looked with favor on some kind of random selection procedure, I couldn't help thinking about the reaction of a patient being prepared for surgery when it was revealed that he would be operated on by a doctor who had been admitted to medical school by having his name drawn out of a hat. Mention was made of the selection system that was started in the Netherlands in 1972. A Dutch cardiologist at the University of Utrecht has called this system immoral, and a direct threat to science.

Now many schools are exploring new ways to evaluate an applicant's motivation for a career in medicine. Fifteen years ago the right answer for a student to give when asked about that motivation would be some expression of ambition to see patients, to serve humanity, and to contribute to the advancement of medical science by doing research. More recently, the right answer has seemed to be an ambition to render service to the underprivileged and the medically indigent by improving the health care delivery system. Will the right answer tomorrow be, "I favor national health insurance." And what will the right answer be in 1984? Are these criteria or dogma? A newsman's traditional role is to challenge the establishment, but in the face of this morning's strong and uniform indictment of the conventional medical school selection procedures I find myself compelled to serve as a kind of counterbalance and defend the establishment.

We have been told that the present selection methods, based primarily on GPA and MCAT scores, do not predict who will make good physicians, but merely who will survive the first year of medical school. Nevertheless, perhaps the proof of the pudding is in the eating. What has been the performance of these graduates of American medical schools in the eyes of consumers? By and large the American public gives the medical profession high marks. Studies have repeatedly shown that most people, including those from low-income groups, are pleased with their doctors. To be sure there are shortcomings, especially in the distribution of medical services; but these, too, are gradually being overcome by the law of supply and demand, forcing physicians to fan out from the metropolitan areas. We do not see today, as frequently as we did in the past, the banner over a highway saying, "This town needs a doctor."

It is more than coincidence that the golden age of medicine parallels the period in which emphasis in medical centers was placed on scholarships and research. How many millions of lives have been saved by discoveries in this period, without which well-meaning, compassionate, committed, sensitive, and humanitarian physicians would be helpless? My newspapers and many others have printed the warm and nostalgic painting of a compassionate physician sitting at the bedside of a dying child. I would prefer that my child be given a little penicillin. If the physician also had some sensitivity and compassion, that would indeed be a welcome bonus. But as one who has covered the frontiers of medical research for more than a quarter century, I find myself uneasy this morning over remarks that seem to downgrade the importance of science and scientists in the teaching of medical students.

Is the traditional environment of scholarly inquiry to be replaced by sensitivity training and compassion classes? If medical students are to be selected primarily for their promise of having good bedside manners, why not choose them from the ranks of nurses? I think we tend to use the terms compassion, commitment, humanitarianism, dedication, sensitivity, and social outlook rather glibly. They have tended to lose their meaning and become code words, like motherhood. How does a selection committee in a 30- to 60-minute interview determine an applicant's compassion and humanitarianism, or evaluate what is said on the application blank? What evidence is there that academic superstars cannot also be humanitarian? Are intellect and compassion mutually exclusive attributes?

In addition to being uneasy over the apparent desire to dilute the medical school as a seedbed for scholarship, it is also disturbing to observe efforts to divert medical schools from the traditional role of preparing students for medical care careers to health care careers. As Dean Berliner of Yale Medical School has pointed out, a doctor's first obligation is to take care of sick patients, and to restore their health; the primary role of the medical school is to provide students with the background, the principles, and the science that will enable them to fulfill that obligation. Obviously any doctor wants to keep a patient healthy, if it is at all possible, but we know that once you get past immunization there is relatively little that can be done effectively in preventive medicine. We know that most ill health derives from economic, social, and environmental factors that are beyond the time and competence of physicians to remedy. For example, the National Cancer Institute recently estimated that 80 percent of all cancers originate from environmental and genetic causes.

Certainly a doctor can tell a patient to stop smoking, eat a low cholesterol diet, lose weight, have the blood pressure checked regularly, or to have Pap smears and breast examinations, but the number of diseases that that doctor is going to prevent by such advice is rather small. In short, it is the responsibility of doctors to identify noxious influences and join with colleagues to limit them. But it is questionable how much any doctor can do as an individual. If we get physicians heavily involved in the social and political aspects of medicine, they will be lost as practicing physicians. They have insufficient time for everything now. A prominent academician reported to me in informal conversation that some of his senior medical students did not know how many cubic centimeters were in a teaspoon. "How," he asked, "can these students prescribe drugs? Ten years ago, if I asked that question students would know the answer. Today's students know much less about the fundamentals of medicine because medical schools are trying to satisfy too many other outside interests and too many outside pressures. With the quantity of new knowledge growing geometrically, faculties don't have enough time now to teach students what they should know."

Finally, we have heard the GPA and the MCAT criticized here, not only as poor predictors of clinical and professional competence, but as discriminating against the underprivileged because these measures of achievement are oriented to middle class values. Suggestions have been made here for diluting their importance, giving greater emphasis to noncognitive values. But what evidence is there that noncognitive attributes predict a good physician? I think this audience should be reminded that a new admissions test will be given to medical school applicants next spring. It will be known as the MCAAP (Medical College Admissions Assessment Program) and is said to emphasize skills and problemsolving, as Dr. Gelhorn called for, instead of simple factual knowledge the students have been able to cram in during their premedical studies. There will even be a separate score for problem-solving ability, which should help applicants from disadvantaged educational backgrounds. Mathematical questions will no longer require a knowledge of formulas and equations but instead a grasp of logical concepts. This new test is a product of 3 years of research by the Association of American Medical Colleges. It has been drawn up with the goal of greater fairness to the educationally disadvantaged and of selecting students who would make good physicians, not just good medical students. Already pretesting has taken place among 300 premedical students, including all ethnic and cultural groups. Perhaps, we should give MCAAP an opportunity to succeed before throwing out the baby with the bath.

But now to my questions. The panelists have highlighted, as a basic issue that the medical schools must face, the rights of individuals versus the needs of society. In view of the rapidly rising cost of tuition, the severe cutbacks in Government financial aid, and the scarcity of loans and financial assistance, isn't the issue you regard as basic going to become irrelevant in that schools will be forced to begin looking at an applicant's ability to pay for an education? And won't that situation curtail the applicant pool, place an even greater burden on minority students, and cause them to look elsewhere for a career?

Dr. Robert Q. Marston: Well, that is precisely the fear I have. My concern is not only about the rights of individuals but also of how society will be served. There is ample evidence that society benefits from the contribution of individuals whose opportunities have been compromised: displaced persons, refugees, the whole wave of immigrants who would have been denied a place in this country if we admitted only those who came from an economic or social elite. I am concerned about the trends, for two important changes are occurring in the financing of medical education. Many medical schools, for example, are increasingly dependent on the private practice income of physicians to support educational programs. It harkens back to the time when the most prominent faculty members had both a downtown office and a medical school office. And because the money was made downtown, classes were missed when conflicts occurred. It is not much different if financing medical education is derived more and more from the practice of medicine in teaching hospitals.

I also see the increasing tendency to have the cost of education in medical school borne by the individual student, a tendency that has caused me great concern, but my approach to the solution of this problem is changing. Two years ago I was a strong advocate for direct institutional support of medical education. Now I find myself looking more favorably at the idea of Federal funds, and possibly State funds, being tied to the individuals who actually use those funds to underwrite some of the institutional costs of education.

I hope that what you predict does not occur but I see disturbing trends that would in the long run have serious disadvantages for meeting the needs of individuals or of society. I think there is little chance of continuing the land grant university tradition of keeping tuition sufficiently low to allow access to higher education for all. Even if we do follow this course, the other costs of education--housing, food, and other things--will be ever higher. These are problems we have to come to grips with, and we need to find some better mechanisms for solving them than those I see on the horizon.

Dr. Alfred Gellhorn: In the current Health Manpower bill, which has just come out of conference, the allocation of money for national health scholarships has more than doubled. However, Congress feels less sanguine than Mr. Snider that the geographic or specialty distribution issue is going to be solved by the law of supply and demand. Therefore, national health scholarships have been tied to distribution within the specialties, with more generous support of primary care physicians. I hope we also have the chance to comment on Mr. Snider's concept of what sort of doctors these are.

Mr. Snider: Turning to another question, is the drive to recruit minority students running out of steam? The Coalition for Affirmative Action finds that among 40 medical schools that at one time had aggressive minority student recruitment and admissions programs, only 15, of which the University of Illinois is one, are still continuing them. Dr. Grove, what do you feel as you look at the situation across the country?

Dr. William J. Grove: There has been a slight reduction in the minority applicant pool so that the enrollments throughout the United States are down from approximately 10 percent to 9.2 percent.

Mr. Snider: What is the ideal figure?

Dr. Grove: I don't know that there is an ideal. When we first started the Medical Opportunities Program at the University of Illinois, the minorities on the Admissions Committee kept pushing for a quota. I insisted that there would be no quota, and there is none now for any minority.

THE PROBLEM OF SELECTION

General Discussion

Participant[*]: Should we not give the MCAAP a chance to solve some of the problems that have been discussed here this morning?

Dr. William J. Grove: Personally, I do not think it will make any difference.

Dr. Alfred Gellhorn: The movement to this new medical aptitude test is a result of the pressures that have been placed on, and the criticism that has been directed to, the current selection procedures. I hope that it will be better, but it does not mean we should relax our search for even better methods of selecting students.

Participant: Has there been a public discussion of mechanisms of a random selection or a lottery method? I hear this issue mentioned at various meetings but I have not heard it seriously discussed, and it seems to me to be about time to look into mechanisms.

Dr. Grove: I am unaware of a public discussion with respect to medical education but we have had some personal experience. The University of Illinois at Urbana several years ago attempted such a technique for selecting those who would be admitted to the College of Liberal Arts and Sciences from a pool of qualified candidates. There were simply not enough places for all qualified applicants and a random selection system seemed the fairest selection method. It was soundly rejected in the public press, and the general outcry was such that it was never implemented.

Dr. Robert Q. Marston: There was certainly a general public discussion of such a lottery in Florida this spring. Personally I am not against looking at the use of a lottery. When the selection process reaches the point at which intelligent discrimination among applicants is no longer possible, then I think the most honest thing is random selection.

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[*] Editor's Note: Participants were not identified during the general discussions.

Participant: Has there been enough work to establish criteria for identifying a pool for such a lottery? I am particularly concerned about the wide variation among undergraduate institutions that the applicants attend and the potential variability in the meaning of grade point averages that the students would present.

Dr. Gellhorn: In our program we select students from high schools and attempt to develop an entirely integrated experience in the undergraduate college and medical school programs. We obviously have wide disparity among the various schools in the New York City public school system. Students who come from the Bronx High School of Science, which itself has a competitive admission policy, have a great deal more factual knowledge than students who come from high schools in highly disadvantaged areas. On the other hand, we find that all of these students, who come in with a 90 average in their course work, have the capacity to learn. Those who have more factual knowledge have an easier time at the start but all have the capacity to succeed.

Participant: One of the fears of a lottery system is that it may create the serious problem of disincentive. This country is founded on reward for effort expended. While there is a kind of fairness in a lottery method, the awesome thing about contemplating it, and much of the public resistance to it, comes from an abridgement of our tradition that individuals are rewarded for efforts put forth.

Dr. Grove: I can only concur with Dr. Marston's view that when you get to a point where it is literally impossible to identify those who will be successful practitioners, I don't think symbolic distinctions make any difference.

Mr. Arthur J. Snider: We have been talking about general policy matters but I would like to get down to the hard questions that come regularly from disappointed mothers whose children did not get into medical school. Dr. Grove, you seemed to acknowledge that there is a method of selection by privilege, including the privilege of being the child of alumni or financial contributors. What influence do Senators and Congressmen have on the admissions process? And why are there a disproportionate number of sons and daughters of physicians accepted into medical school?

Dr. Grove: As to the influence of politicians, at the University of Illinois, there is none, absolutely none. With respect to the acceptance of greater numbers of physicians' children, I suppose in some institutions the children of alumni are regarded a little bit differently than others. In my experience at the University of Illinois many more letters are written to disappointed alumni than to anyone else. Their children are neither favored nor discriminated against.

Participant: As a premedical adviser for 25 years, I am greatly disturbed today by the comment that we do not need at least 2 years of chemistry in premedical education, because it seems to me that medicine is getting more biochemical and biophysical every day. How can someone get by with less than two years of chemistry?

Dr. Gellhorn: I believe I did not specify the amount of time allotted for chemistry. The vast majority of students elect to study a lot more than two years of it. It is in organic chemistry, however, that the emphasis seems entirely irrational although I would be delighted to be challenged by anybody. Why should medical students need to know how to synthesize nylon, one of the most common laboratory exercises students go through? Organic chemistry should be contributory to biochemistry and it does not require study of an endless amount of material. Students going into medicine should be prepared for medicine, not to be professional chemists or physicists or mathematicians. If courses are really oriented to what is needed for an understanding of the basic biomedical sciences, the reduced amount of time spent studying could be dramatic.

Participant: As a biochemist I take marked exception to such a suggestion, for if there is any part of chemistry which involves problemsolving or creative thinking, it is organic chemistry. However, I certainly agree that memorizing miles of mechanisms is superfluous. I also agree that the half-life of the facts learned is quite short. Attack time spent in physical chemistry if you want, or in history or English, but do not attack the creative thinking that goes on in organic chemistry. To do so reveals an unfortunate lack of premedical training.

Participant: Dr. Grove, in your consideration of identifying a pool of candidates from which random selections could be made, how would you deal with the issue of emotional balance and maturity?

Dr. Grove: One of the parameters I suggested for developing the pool was a carefully designed interview system, and

I do not mean one conducted by faculty members or students or alumni who are doing it occasionally, rather I mean screening interviews administered by trained professionals. Our faculty has suggested such a procedure. It is costly and we may not at the moment be able to get it off the ground. But I believe that if we could set up a structured system with multiple interviews by trained personnel, we would probably identify the emotionally disturbed as well as, if not better than, we do at the present time.

Participant: I would like to know if the inflation of grades in the humanities has played some role in the greater priority given to science achievement in the selection process. Is an A in English easier to get than an A in science? Is that one reason why the humanities count for less than the science?

Dr. Gellhorn: I am not sure I can respond directly to your question. I have been told by many premedical students that in the nonrequired area (which is essentially the nonscience disciplines) they shop around for courses where they are reasonably assured of a good grade and shy away from courses in which there is the possibility of a modest grade because that will disturb their overall average. This is one of the distortions of education that I think so dreadful and which really demands reform.

Participant: Much has been said about the admissions selection process, but would someone please comment on how communication lines are established between medical schools and the undergraduate divisions that are contributing to the pool of selectees?

Dr. Grove: One mechanism I can suggest is for periodic conferences like this, in which the medical schools invite major feeder colleges and universities to participate in a dialogue that allows premedical advisers to be brought up to date on current policies and procedures in both admissions and curriculum. The technique would serve to uncover differences between what we say and what we do.

Participant: It seems clear that present selection proce--dures identify well those who will succeed in the first year of medical school. But if the goal is to identify a successful practitioner, not a successful medical student, these procedures seem less effective.

Dr. Gellhorn: That is exactly the point. Academic criteria are wonderful at predicting how the student will do in the first year but after that predictive validity begins to dwindle and correlation with performance as an intern, or in practice, is virtually zero.

Mr. Snider: Dr. Gellhorn, you said that only a limited number of schools state their goals for medical applicants. Would you favor a more detailed listing of criteria by which students are chosen, or would this merely offer shrewd applicants an opportunity to tailor their applications and their interviews to fulfill these requisites? And further, would it be appropriate to tell a rejected applicant why he did not succeed?

Dr. Gellhorn: Yes, I think it is very important for medical schools to define their objectives and to define the criteria they use for the selection of students. They need to learn sometime whether they can really distinguish the individual who is going to be a biomedical scientist from the one who is going to provide comprehensive care. And if you ask whether students will tailor their responses to these specifications, well, anyone who works on an admissions committee knows how that is done and must have learned not to be snowed easily.

Background Paper

2. THE PROBLEM OF PROGRAM

"The undergraduate experiences of medical students have been described in various ways--'rat race' and 'pressure cooker' are but two of the commonly used epithets." So begins the description of yet another plan for modifying a medical curriculum.

The demands for program changes arise from such sources as student discontent, faculty vision or disillusionment, special interest groups, and Federal carrots or sticks, among others. Recently, the persuasion of money, in the form of capitation grants, has seemed most influential vis-à-vis medical curriculum. The immediate effects have been increased efforts to train physicians for primary health care roles and to program medical school education in less than the conventional 4-year time span.

Sixteen medical schools now offer 3-year programs and another 17 provide that opportunity as an option. Although the remaining 72 schools have maintained a 4-year requirement, the final year (or some major segment of a single year) is commonly elective in content although required in time. It has been pointed out, however, that the real instructional time difference between 3- and 4-year programs is not as great as the calendar difference might suggest. Among 4-year schools, the median instructional time is 38 months (with a range from 32 to 48 months), while in those where an M.D. may be obtained in less than 4 years, the median instructional time is 36 months (with a range from 27 to 38 months). In more than half of the 3-year schools, faculty members are reportedly dissatisfied because of the burden such an effort places on them and their students. In 89 percent of these schools, however, the students are pleased with the education they receive. In a few of the 3-year settings the faculty view has precipitated return to a 4-year offering, despite the absence of any significant difference in 3-year and 4-year student achievement in those schools which offer both tracks.

If the issue of time seems unsettled, that of program organization and content is even more uncertain. The only regular finding is that basic science precedes clinical science (although in at least a few schools that dichotomy has been badly blurred by introducing a substantial amount of clinical experience from the beginning). While the strictly departmental organization of instruction in the basic sciences still exists in a majority of schools (66), some variant of organ system or integrated programming is the organizational pattern in 30, and a mixture of the two in another 20. For the clinical period of instruction, however, virtually all schools continue to offer regular and elective clerkships in an exclusively departmental pattern. One of these departments is often called family practice or community medicine, but inspection of the 1975-1976 Association of American Medical Colleges curriculum guide leads to the conclusion that specialty instruction by specialists is the dominant pattern of clinical teaching despite intense pressure to modify institutional climate and value system in favor of primary care.

The nature of instruction, like curriculum time and organization, has also undergone changes. Some of the major instructional innovations have occurred as follows:

Percent of Medical Schools

	1972-73	1973-74	1974-75	1975-76
Self-Instruction	15	30	71	63
Independent Study		39	57	49
Computer-Assisted Instruction	4	13	58	59

While these newer techniques, which encourage independent rather than dependent learning, appear with increasing frequency, lectures are still among the most popular of the instructional techniques employed by medical teachers. A random sampling of 10 medical schools listed in the 1975-1976 AAMC curriculum guide showed scheduled lecture hours per week to be 14, 14, 17, 10, 9, 12, 15, 13, 12, and 17 (the last a new school).

Evaluation of student progress is almost universally in the hands of individual departments which employ a variety of assessment procedures. With a few notable exceptions, this evaluation is conducted without assistance from experts in the science of tests and measurements. The examinations prepared by the National Board of Medical Examiners are widely used to supplement, or as a substitute for, internal testing methods. Thirty-three schools (28.2 percent) require successful completion of Part I for promotion and of Part II for graduation. Individual discipline scores derived from National Boards are frequently employed in grading students. Thirty-three schools (28.2 percent) use only pass or fail descriptions, while 32 (27.4 percent) use letter or number grades. Nearly one-quarter of the schools (23.1 percent of 27 institutions) still record student rank in class according to GPA.

Graduation from medical school, however, is roughly the midpoint in formal education for most students, since virtually all continue with internship and residency training for from 2 to 8 years. Currently, graduates may enter a rotating internship with a major emphasis, or go directly into one of the more than 20 approved specialty programs. Although nearly half of the hospitals approved for internship and residency are affiliated with medical schools, these graduate programs are controlled primarily by agencies apart from the universities, chiefly the Specialty Boards that specify the required training time and content, and certify successful completion of preparation for specialty practice.

More than 60,000 individuals are now enrolled in internship and residency (10,000 more than are registered in medical schools), and approximately one-third are graduates of foreign schools. Of this total, less than 800 are listed in family practice programs, although an undetermined number in general internal medicine, pediatrics, and obstetrics/gynecology may be preparing for careers in primary care. However, even if all those now enrolled in these specialties were to end delivering primary care, they would represent less than 25 percent of the total resident pool. It is this skewed distribution that many leaders regard as a critical social problem for medical educators to resolve through significant alterations in basic and graduate educational programs.

Whether medical school faculty and hospital staff members can accomplish these fundamental changes remains to be seen. Many observers are skeptical, and express the belief that such changes will not be accomplished without coercion. Others question whether educational changes can be brought about by those who have been trained as biomedical scientists or clinicians, but who have rarely been held strictly accountable for their work as educators. It has been pointed out that medical teachers and practitioners engage in a continuing critique of research, and are now beginning to examine systematically the quality of health care they deliver. In the domain of instructional effectiveness, however, in most medical schools there has been almost no spontaneous effort to secure even simple quantitative assessments. The closest approximation to accountability has been in the form of student questionnaires--sometimes undertaken by the instructors, but usually undertaken at the initiative of the students themselves.

On the other hand, medical schools during the last 15 years have probably given more attention and support to the study of their educational processes than any other professional school within their universities. Nearly half now have some clearly designated group charged with responsibility for educational research and development. These units are also giving increasing attention to faculty development programs, and the AAMC has established a Division of Faculty Development to assist individual schools in their efforts to improve staff qualifications for the professional responsibility of educating students. Thus far, however, no school has institutionalized a mechanism for assuring this qualification as a criterion for faculty appointment or promotion.

In the light of these issues, the panel concerned with the problem of programs should address the following questions:

- Is the present organization and content of medical education suited to the preparation of graduates who will meet the most pressing health service needs of our society?
- Is an arbitrary time criterion for either basic or graduate education in medicine still appropriate? Is a competency criterion feasible?
- Are the dominant instructional techniques likely to assure efficient and effective initial learning, and to establish in students the habit of personal responsibility for continued learning?

- Are the evaluation practices presently employed those which will provide suitable data upon which to base judgment about professional competence?

- Is there a need for establishing systematic faculty development programs which address specifically the professional knowledge and skills of education?

THE PROBLEM OF PROGRAM

Robert H. Ebert, Ph.D., M.D.

All of us were asked to say what we wanted to say, but also in the course of the presentation to answer five specific questions. I have managed to answer number one, but I have not fared well with the other four.

Is the present organization and content of medical education suited to the preparation of graduates who will meet the most pressing health service needs of our society?

It is important to define our terms before proceeding with the discussion of this first question, for there is a significant difference in the meaning of the question if one substitutes the term health needs for health service needs. Health needs is a far more inclusive term and relates to general problems of public health including nutrition, control of infectious disease, and environmental safety, as well as to personal health care. On the other hand, health service needs can be assumed to refer to the actual provision of care to individuals or groups of individuals. I also assume that we are speaking of health service needs in the United States and not globally.

Medical education is a continuum beginning with the collegiate experience and continuing through medical school training into the internship and residency experience. It progresses from the most general (college) to the most specific (specialty training) learning, and it is important to recognize the different purposes of these several phases of the educational process. The collegiate experience and the preclinical phase of medical school are similar in organization and are university oriented. The clinical phase of medical school is increasingly hospital oriented and, of course, the internship and residency phase is almost entirely hospital directed.

Periodically, the purposes and goals of general education are debated and attempts are made to redefine the content of a general education and, of course, there are no satisfactory answers since no one is quite sure what an educated person is supposed to know or how he or she is supposed to behave. The majority of premedical students are less concerned with this debate than the job of getting into medical school, and conventional wisdom tells students that their chances will be best if they major in science. The consequence is that premedical students are less likely than non-preprofessional students to explore areas of knowledge which they believe are unrelated to medicine. I make this point not in order to plead for greater exposure of the premedical student to more general education, but rather to suggest that the biological sciences related to medicine offer a perfectly reasonable science concentration. I shall return to this issue later.

Over the past 25 years there has been considerable experimentation with medical education, and few schools have failed to change the medical curriculum at least once in that period. One might have expected that this commitment to change would have resulted in a greater variety of medical school educational experiences. What is remarkable is the similarity among medical schools and not the differences. Schools may vary in the manner in which they present basic biological sciences, but all provide the student with a general background in biology including behavioral science. Interestingly, the range of biology offered the medical student is usually much broader than that given the Ph.D. student in biology. All medical schools provide the student with an understanding of pathophysiology, although the concept may be presented in different ways, and all teach the students certain clinical methodologies which enable them to examine patients in a structured manner. A variety of other subjects may be presented with greater or lesser emphasis depending upon the interests of the medical faculty, and these include preventive medicine, community medicine, medical economics, and medical ethics. The fact that there is less unanimity of faculty opinion about these subjects is a point of interest. The only unique teaching exercise in medical school is the clinical clerkship, for it provides the student with a problem-oriented learning experience in the real world of medicine.

The internship and residency years are a period of intensive training in a particular discipline or specialty of medicine. There is a varying amount of didactic teaching but the more common teaching exercises are "teaching rounds," seminars, and conferences. The intern-residents learn by assuming an increasing responsibility for the care of patients as they progress through the training program, including supervision of patient care provided by those junior to them. The content of the training program is defined directly or indirectly by the specialty board responsible for certification of the resident upon completion of training. While there has been continuing discussion about university responsibility for residency training, the facts are that the teaching hospital and the specialty board determine the organization and content of the program.

I have gone into some detail in this review of the education of a physician because of the question posed to the panel. If we are to consider the need for change in the organization and content of medical education, we need to judge the likely impact of change at different times in this continuum. And finally we must discuss what we believe to be the most pressing health service needs in our society.

The usual approach to health matters in this country is categorical whether one is discussing research priorities or service needs. The categorical approach may be by disease--cancer, heart disease, stroke--or by age and sex, for example, maternal and child health or care of the aged; or by the magnitude of the social problem, for example, alcohol and drug abuse. Indeed, the debate about overspecialization and the need for primary care physicians is directly related to this categorical approach to health and disease.

I would like to suggest that the most pressing health service need facing our society is the overall organization of health services. What we need is a system or systems of medical care which provide universal access to a reasonable range of medical services at a cost that can be controlled. I recognize that this is a tall order. However, failing some attack on the fundamental organization of health services, I feel we are destined to have another inflationary spiral of costs with little benefit to patients.

It is evident to anyone who has followed the current debate on health manpower legislation that the Congress perceives this problem as one of health manpower and not of organization. Just as the problem was oversimplified at the beginning of this decade by assuming that an increase in the training and certification of physicians would solve the problem of the availability of care, so once again it is assumed by the Congress that changing the mix of residents in training will provide a rational distribution of physicians' services throughout the Nation. I do not suggest that the distribution of physicians among the specialties is unimportant in determining the kinds of medical services available to the public, but I happen to believe that the organization of health services should dictate the health manpower needs rather than attempting to structure services on the basis of some predetermined formula for the production of specialists and primary care physicians.

In whatever manner a solution is sought, whether by manipulating the manpower pool or attempting to reorganize the provision of services, the same questions can be asked about medical education. Is the content and organization appropriate to an inevitable shift in the relative proportions of the specialists in training? This is both a quantitative and qualitative question. In other words, we might be training too many neurosurgeons or ophthalmologists, but the educational programs might be entirely appropriate, so that one would simply reduce the numbers. Conversely, we might be training the appropriate number of pediatricians, but the educational program might be wrong. It would take far too long to examine each medical specialty in these terms, so I shall look only at the primary care specialties, including family medicine, general internal medicine, and general pediatrics.

Since medical education is a continuum, let us start with college. I personally doubt that the educational programs offered make as much difference as the differing aptitudes of students. The studies by Dan Funkenstein suggest that students with high verbal ability and demonstrated concern for others are more likely to seek careers in primary care than students with high quantitative scores. Because of the aptitudes of such students, they are likely to have done well in the social sciences or humanities; so to this degree one may choose compatible candidates for primary care fields. I do not suggest, however, that any special curriculum need be designed for the premedical student who might wish to pursue a career in primary care.

What about medical school? Should the curriculum be changed to foster an interest in primary care, or should there be tracks so that students with different interests can pursue different tracks? I am inclined to the view expressed by Dr. Wearn in describing the Western Reserve Medical School experiment, namely, that the medical school student should remain an undifferentiated "blast cell" who can differentiate in any direction after graduation. In other words, I doubt that it is wise to structure the medical school portion of education so that the student begins to specialize too early and I include primary care as a specialty. On the other hand, there should be broad areas of educational opportunity open to students with a variety of interests from molecular biology to public health. There should be curricular offerings in primary care just as there are in other areas of clinical medicine, but the success of these courses will depend to a significant degree on the quality of resident training in the primary care programs.

I do not wish to discuss still another revamping of medical school education, but I do wish to comment on one major omission in the education of the physician. It seems to me that the justification for introducing educational material into the medical curriculum is the universality of the principles to be taught. On this basis, one can justify the biological disciplines, pathophysiology, clinical methodology, and the clinical clerkship as an approach to problem-solving. Physicians as a group need not be expert in management, medical economics, the organization of health services, epidemiology, or biostatistics; but there is an area of knowledge which encompasses certain aspects of these fields which physicians as a group should understand. Physicians are reasonably good at making decisions about individual patients on the basis of incomplete data. They are far less skillful in making decisions about the relative utility of new forms of diagnosis and treatment. Too often, more is better and the latest test or therapy published in the New England Journal of Medicine is recommended more on the basis of novelty than proven utility. The rational basis for such decisionmaking is poorly taught in most medical schools, in part at least because such instruction is usually detached from the clinical setting. If this area of knowledge is to have any impact on medical students and house staff, it must be taught in the clinic, using many of the same techniques which have been successful in teaching clinical medicine. To a greater or lesser degree, all physicians will be involved in such decisionmaking in their offices or their hospitals and more broadly in their specialties, and yet they are presently ill-prepared for the task. The example must be set by the teaching hospital and the critical evaluation of clinical procedures must be built into the thinking of all physicians, including those in primary care.

Following this digression let me turn to the most critical part of the education of the primary care physician, namely, the postgraduate years. We would all agree that there are too few positions available for training in primary care, so that there needs to be some quantitative readjustment. But what about the quality of primary care programs? It is my judgment that both the organization and content of residencies in general internal medicine and general pediatrics need to be changed. Most residencies are financed via hospital reimbursement and the justification for residents' salaries and the cost of residents' education is service to the hospital, and the major service provided is the care of inpatients. To be sure OPD (outpatient department) care can be justified as well, but if one wishes to provide a larger amount of ambulatory experience than ordinarily provided, or experience in ambulatory centers not under the administrative control of the hospital, it is difficult to justify the additional expense. Curiously, none of the proposed health manpower legislation which is meant to encourage primary care training has faced this problem directly. Some different form of financing of primary care residency training is needed, and it should be financing which is ongoing and not dependent on grants.

Much more needs to be done to define the content of primary care residencies whether in internal medicine, pediatrics, or family medicine. Fortunately, there is an increasing interest in redefining content among the specialties themselves and in training centers, so that we can anticipate substantial progress in the immediate future. It is also evident that each of these primary care areas will contribute to the others as experiments if new forms of primary care training are carried out. Furthermore, the specialties of medicine which can contribute to the education of these primary care physicians, such as otolaryngology, psychiatry, orthopedics, and gynecology, seem willing and even anxious to cooperate in primary care training programs.

Let me summarize my position as follows: The most pressing health service need of our society is reorganization of our medical care delivery system. This is not something which will be accomplished by altering the medical education system. Congress perceives the problem as one of manpower rather than organization but whichever approach is correct, one consequence will be a redistribution of physicians among the specialties with an increase in the number of primary care physicians. The major educational change needed is in the organization and content of primary care residencies. I am optimistic about the chances for rapid change in view of the interest in the problem shown by the specialty boards as well as medical centers.

I have spent most of my time commenting on the first question, therefore, let me answer the others in summary.

Is an arbitrary time criterion for either basic or graduate education in medicine still appropriate? Is a competency criterion feasible?

One can make the argument that time alloted to various phases of education is arbitrary, and yet various experiments to alter the system have not persuaded the majority that the approach should be changed. In my own view, time could be saved by combining the last 1 or 2 years of college with the first 2 years of medical school. This, it seems to me, is a more practical approach than shortening time spent in medical school. The length of residency training should certainly be reevaluated from time to time since the temptation seems to be to lengthen the training period rather than shorten it.

I doubt that competency criteria will ever substitute for some arbitrary times alloted for various phases of medical education. I say this because I doubt that any system of evaluation is adequate to make the judgment needed.

The third question was, Are the dominant instructional techniques likely to assure efficient and effective initial learning and to establish in students the habit of personal responsibility for continued learning? I disclaim any expertise in the area of instructional techniques and, therefore, cannot comment in a critical fashion on the first part of the question. The second part, namely, the personal responsibility for continued learning, seems to me to relate more to the educational environment during medical school and postgraduate training than to the educational techniques employed. In other words, a critical and questioning educational environment is more likely to encourage continued learning than is a particular technique.

As for the fourth question, Are the evaluation practices presently employed those which provide suitable data upon which to base judgment about professional competence?, the answer is probably not. True professional competence can be judged only by sampling what physicians actually do in their practices and the techniques for doing this are still rudimentary. Larry Weed's problem-oriented record attempts to tackle the issue, and other systems have been suggested, but none to date is entirely satisfactory.

Finally, is there a need for establishing systematic faculty development programs which address specifically the professional knowledge and skills of education?

I believe there is, and I believe that faculty development should be built into our academic training programs just as we build in research training. Ph.D. students in the basic sciences should be required to teach as should post-doctoral fellows in preclinical and clinical departments, and there should be instruction available in the field of education. Faculties should be as critical of teaching ability as they are of research and clinical ability.

THE PROBLEM OF PROGRAM

Irving Schulman, M.D.

During the past 15 years an extraordinary number of committees, conferences, commissions, and studies, prompted by public and private agencies, organizations and foundations, and universities and individuals, involving a broad representation of the citizenry, have addressed themselves to the very questions which are posed at this meeting. From these activities emanated a veritable library of reports containing analyses of the problems and recommendations for their solutions. In my view, the most significant of these were the Coggeshall report of 1965, the Millis Commission report on The Graduate Education of Physicians of 1966, the report of the Carnegie Commission on Higher Education of 1970, the Millis report on A Rational Public Policy for Medical Education and Its Financing of 1971, and the Report of the Committee on Goals and Priorities of the National Board of Medical Examiners on Evaluation of the Continuum of Medical Education of 1973. From a different viewpoint, that of a medical economist, but addressing the same questions is the recent book by Victor Fuchs, Who Shall Live? (1973). Of all the reports, it is my opinion that Millis' report of 1971, a document that I consider remarkable for its scholarship, clarity, and vision will prove to have the influence and significance for decades to come as did the Flexner report for over half a century.

The many studies of the past 15 years were strikingly consistent in identifying the historical trends and the internal and external pressures which made an upheaval in the established tradition of medical education inevitable, and there was an almost unbelievable concensus in the identification of the major changes which had to be made.

The Flexner report of 1910 stands as both hero and villain in evaluation of medical education in the United States and as an etiological factor in the problems now being faced. It may come as a surprise to some that in 1900 "less than 10 percent of the practicing physicians were graduates of medical school, and only about 20 percent had ever attended lectures in medical school" (Coggeshall 1965). There were said to be, at the time of the Flexner report, about 150 medical schools in the country, the majority being unaffiliated with any educational institution. Medical education, to a large degree, was conducted by apprenticeship, or in proprietary trade schools. The Flexner report caused medical schools to move closer to universities, caused the development of full-time faculties and resulted in the creation of a curriculum based upon course work in basic sciences followed by clinical experience. It also caused one half of the existing schools to close, and sharply reduced the output of practitioners, so that 42 years later--7 years after World War II--there were still only 77 medical schools in the country and the number of graduates equaled about 5,500 yearly. It also caused the establishment of a curriculum in medical school that was virtually uniform and rigid in time and content in every school. The only significant change until the late 1950's and early 1960's was the shortening of undergraduate and graduate training during the war years.

It has been said that it was the success, not the failures, of the post-Flexner half decade that helped to create the problems which became glaringly evident by 1960. For that system of medical education produced a generation of biomedical scientists ready and able to contribute substantially to what has been termed "the explosion of scientific knowledge" in the 15 postwar years, and which still continues. This phenomenon, fueled by massive governmental support of biomedical research and research training, made it increasingly evident that "the system had become overloaded--that we could not cover superficially every new field of biomedical knowledge without causing the whole system to fail" (Lippard 1972). The escape valve was a marked extension of the graduate years of medical education, soon exceeding the number of undergraduate years and thereby increasing specialization. The spectacular advances in scientific knowledge and their rapid and dramatic application to many areas of curative and preventive medicine generated an increasing demand for medical service by the public as new sources of payment were made available and as the belief in the entitlement to medical care grew ever stronger. The public soon concluded, however, that the numbers of physicians needed to deliver such services and the types of physicians able to guide the patient through the array of specialists and technologies were simply not available. Many other forces were unquestionably at work simultaneously, not the least of which were the medical students themselves. From this group came the demand for more relevance of their undergraduate medical education to their ultimate professional goals and the growing concerns about the cost of their education and the long and increasing amount of time before they could practice their profession.

Against this background, pressure for changes in medical education was irresistible. The initial thrust was toward the goal of increasing the output of physicians (Dr. Millis always emphasized more and better physicians). Soon thereafter, qualitative, as well as quantitative, changes were also emphasized. Goals and objectives about which there was almost unanimous agreement were clearly stated in the Millis report of 1971. There is, stated the report:

> . . . urgent need to alter medical education in order to produce a diversity of physicians in place of physicians of a uniform pattern. The implementation of this change will require alteration of the admissions requirements, the educational process, and the educational environment. . . . Medical education must become a substantially individualized experience. . . . The learning mechanism must be vertical and whole, that is unique to each track. . . . If this condition is to be met, the arrangements for teaching and learning must be altered. Required and standardized courses become less generally useful. Lectures to all members of a class become less effective. Common textbooks become less meaningful. The emphasis must shift from being taught to self-directed learning. Lectures and laboratory exercises must be replaced by programmed learning. Measurement by common examinations must be replaced by individualized assessment and graded achievement. Electives must replace requirements.
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> When the objective for all students was the skill required to deal with ill patients in the hospital, the acute hospital was an appropriate learning environment. For the physician whose function is to be one of medical care rather than medical cure, the acute hospital is not an appropriate learning environment. Hopefully, well patients will not be in hospitals but in different kinds of institutions and places. They will be in

> clinics, offices, homes, schools, and communities. Thus, the medical schools must operate in a greatly diversified set of health environments. This will require an entirely new set of arrangements, new relationships and a much more complex organizational scheme (Millis 1971).

Since a significant time has now elapsed since an apparent consensus was reached concerning both the roots of the problem and the mechanisms for correction, it seems to me that this conference should not merely restate the problems and the questions, but should more properly attempt a progress report. To what extent have major recommendations been implemented? Of those which have been attempted, what obstacles have developed to impede their accomplishment? What new circumstances have evolved which necessitate reassessment of some of the original recommendations? What new recommendations are warranted in light of the experience of the past 6 to 8 years?

In addressing the questions pertaining to the problem of programs, it seems obvious that these are intimately related to those of the other panels, particularly those concerning selection and cost.

With regard to whether the present organization and content of medical education is suited to the preparation of graduates who will meet the most pressing health service needs of our society, one might consider the Millis report (1971) which identified three priorities for action that were to proceed simultaneously. These charged all medical schools to:

- Accelerate change in admission policies in curriculum, in educational methods, and in clinical teaching facilities in order to accept a greater heterogeneity of students, to accommodate their individual differences, and to produce the needed variety of physicians.

- Accelerate growth in the size of the student body to achieve a more reasonable educational efficiency and at the same time to educate more physicians.

- Initiate the organization of a local system of health science education and interdigitate that system with a regional system of health science.

Some assessment of progress toward these goals is possible in quantitative terms, for example:

- The number of medical schools in the United States is now 117.

- The number of students entering medical schools in the United States in the fall of 1976 is approximately 15,500, an increase of 77 percent in the past 10 years. The Millis recommendation of 13,500 admissions by 1975 was surpassed in 1972.

- The percentage of women in entering classes of medical schools had risen from 9 percent in 1965 to 20 percent by 1973 and is estimated to be around 30 percent in the entering class of 1976.

- The percentage of minority students in the entering class had risen from less than 4 percent in 1965 to 10 percent in 1974 and is estimated to be slightly less in the entering class of 1976.

- The free standing internship was abolished in 1975 and more than 90 percent of graduate training programs are now associated with medical schools.

- A high proportion of medical schools now conduct some portion of the educational curriculum, for the undergraduate and graduate, in community hospitals and other health care facilities away from the university medical center.

- An increasing proportion of the medical curriculum, both undergraduate and graduate, is being conducted in ambulatory care settings.

- The number of residency positions in the "primary care" specialties--medicine, pediatrics, and family practice--is steadily increasing and the percentage being filled by U.S. medical school graduates is also increasing. The positions in surgery and other specialties have remained stable or, in some cases, have actually decreased.

> A selectivity rather than rigidity in the medical curriculum is certainly increasingly common.

Assessment of the impact of the changes in medical education on the quality of education and/or the quality of its product, the physician, is far more difficult. The goals of the changes, as stated before, were to increase the numbers of physicians, increase the diversity of physicians, and increase the proportion of those willing and able to provide first contact, as well as continuing comprehensive care for patients, that is, primary physicians. In addition, however, the medical educational process in its totality was aimed not only toward transmitting a body of knowledge and training for technical competence but, more important, to encourage, by promoting the requirements of individual responsibility and self-directed learning, a lifelong commitment to scholarship, involving "the continuing acquisition and critical application of knowledge" (Steward et al. 1976).

While a major criticism of the post-Flexner period was that all medical schools were the same, the variation among the 117 medical schools today is enormous. Although all appear committed to the same general goals, there is tremendous variation in size of student body, size and quality of faculty, adequacy of clinical resources, composition of the patient base, stability of affiliations and quality of affiliated programs, and in financial support of the educational program. Since it is impossible to evaluate the strengths and weaknesses of each program and since it is too soon, even if appropriate instruments were available, to measure the effects of the changes on the practice of medicine and the delivery of health services, one can, nevertheless, cite problems which are common to all schools.

Programs, for example, with a high degree of selectivity and multiple tracks in the educational process demand an effective and sophisticated counselling system, as well as more and better faculty, rather than less. The support of biomedical research in the 1950's and 1960's generated full-time faculties of basic scientists and clinical scientists who contributed significantly to teaching and to patient care. The support for medical education per se was never adequate. Today, the steadily decreasing support of research and research training has forced medical centers and faculty to turn increasingly to direct patient care as a source of support. Thus the general availability of the numbers and type of faculty needed to make the desired educational process work is in serious question.

Curricular changes have emphasized earlier clinical contact for students, greater attention to "relevance," and a vertical rather than horizontal structure in courses. It has been emphasized that as clinical teaching moves down to the traditional preclinical years, so must teaching of the scientific basis of medicine move up to the clinical years of medical school and into the graduate years. Medical education has been urged to become more akin to graduate education in the humanities and sciences, to become truly a university education, and to provide opportunities for students to become educated in the many other disciplines--social sciences, economics, computer technology, biomedical engineering, and so forth--now recognized as necessary and desirable for the practice of medicine. And yet, many new schools have been established which are separated from universities; schools have been established which have separated the basic sciences from the clinical sciences; and programs are conducted where a high proportion of the teaching faculty have neither the time nor the basic skills to sustain the continuum of medical education. The steadily decreasing support for the training of clinician-scientists promises to magnify the problem in the future. While the practicing physician is a highly valued member of the clinical faculty, contributing much that is needed and that cannot be provided by the full-time academician, the superbly qualified medical student of today, coming from outstanding high schools and colleges, will not accept teaching, particularly in the clinical and graduate years, which is episodic, fragmented, and not supported by a firm scientific base.

While an increasing amount of undergraduate and graduate education is being conducted in community hospitals, the ability of such institutions to accommodate teaching programs has varied widely and has created problems. The primary mission of a community hospital is patient care, not education and research. Teaching programs are costly and affect the efficiency and the traditions of the institutions and of their medical staffs. Universities, by and large, have not found it possible to provide the teaching costs; the institutions have often resisted accepting full-time faculty; there is frequently dissension over the control of the educational programs; and, most commonly, there are different perceptions by the university faculty and the hospital's staff of the qualifications for and obligations of faculty appointment. Community hospitals are much more interested in graduate students (interns and residents) than undergraduates. Frequently, the residents are the principal teachers of the medical students; but if the teaching program for the resident staff is inadequate, the system cannot function.

While it is desirable that increasing emphasis be placed on ambulatory care during undergraduate and graduate training, the impact of an educational program inserted into an ambulatory care setting can be substantial. Students are educated in ambulatory care settings, not just to learn "the common problems," but to observe personalized, efficient, and low-cost care. While a qualified resident can contribute to the quality of care, undergraduate teaching may adversely affect the very elements the student is there to observe. Here, too, the questions of staffing, teaching faculty, and teaching costs must be addressed if ambulatory settings are to be effective teaching units. These questions apply to clinics and to the offices of physicians.

Millis (1971) has emphasized that "research is never an end in itself; it is a means to a variety of ends. The ends to be served in medical school research are problem solving, learning by medical teachers, learning by practicing physicians, and learning by medical students." It seems necessary, if the type of physician we desire is to be produced, that exposure to the philosophy, principles, and conduct of research be an essential element in medical education. If the educational environment is devoid of this element, as some appear to be, the life-long scholar is not likely to emerge.

A new problem has recently become evident which poses a serious threat to the continuum of medical education and which requires urgent attention. Since 1973, as a result of phasing out of the free-standing internships and termination of programs of poor quality, the total number of positions for the first year of graduate medical education (GME-1) has declined. In 1976 there were 15,112 GME-1 positions available and 13,500 U.S. medical graduates. During the next 4 years, the graduate of U.S. medical schools will increase to 15,900 in 1980. While this is a serious problem for all graduates, it has become obvious that for the primary care specialties of medicine, pediatrics, and family practice, a shortage of high quality graduate programs existed this year. Against almost all earlier predictions, a shortage of graduate educational opportunities has developed, particularly in those disciplines whose graduates are most urgently needed. This situation creates both challenges and opportunities. There is an opportunity to create the numbers and types of programs that are needed and, hopefully, to focus on their educational content and quality at the outset.

A serious problem continues to exist in the lack of readiness of many medical schools, often the most distinguished and best established, to accept as full faculty, individuals with outstanding skills in clinical teaching and clinical practice. Such individuals whose talents and skills are urgently needed still have difficulty in gaining full faculty status, promotion, and tenure.

Other questions arise. Is an arbitrary time criterion for either basic or graduate education in medicine still appropriate? Is a competency criterion feasible? For undergraduate medical education, the answer to the first question is obviously no, so long as it does not mean the substitution of an arbitrary 3-year curriculum for an arbitrary 4-year curriculum as one mechanism for shortening the total time of medical education. Those now applying to, and being accepted in, medical school are remarkably able as a group, and many individuals have qualifications justifying advanced placement and the granting of credit for those courses in which competency can be documented. A distinction must be made, however, between shortening of the medical school education as a means of saving expense and time, and a shortening because added time is not valuable or necessary for the subsequent career goal of the student. At Stanford University Medical School a curriculum was implemented in 1968 which is completely elective in terms of course content and sequence. The M.D. degree requirements call for registration for a minimum of 11 quarters (33 months) but with advanced placement may be as little as 9 quarters. (Tuition is charged in accordance with the number of quarters registered). Analysis of the graduating classes in the past 4 years indicates that 40 percent of the students were enrolled for 12 quarters (36 months) or less, and could have graduated in this time. However, only 1 percent chose to graduate in less than 4 calendar years. Every indication is that the students used the "extra" time for valuable, relevant, and educational elective opportunities.

The point is that the cost of undergraduate education should not drive the student away from valuable educational opportunities. The students at Stanford are required to pass Parts I and II of the National Board Examinations as a result of the faculty decision at the outset that in a totally elective curriculum the only way in which the faculty (and the public) can gain assurance of student overall competence is by successful performance on a comprehensive externally prepared national examination. This, however, must be accompanied by faculty evaluation of clinical performance and suitability for practice on the basis of personal contact with the students. Recognizing the limitations of examinations, the faculty has, nevertheless, been delighted by outstanding performance of the students in an elective curriculum.

In graduate medical education (the residency) the problem is more complex because we deal here not only with a fund of knowledge which is measurable, but with such concepts as experience, responsibility, judgment, confidence, maturity, and that element which is most difficult to define but easy to recognize, "the qualities of a physician." The rate at which a resident accumulates experience depends upon the number and types of patients, the clinical setting, the number, types, and quality of the supervisory faculty, the closeness of observation, and many others. In these years of clinical education, which immediately precede independent practice, there has been a definition, in each clinical discipline, of the minimum amount of time presumed necessary to develop appropriate experience and skills. Obviously this is arbitrary and it is illogical that the amount of time spent in a strong graduate program should be the same as in a weak one. Increasingly, program directors are being required to testify to the readiness of a candidate for admission to certifying examinations since there is no confidence that any examinations can measure the critical qualities of a physician. Such evaluations, if critically and honestly performed, tend to lengthen the period of training for weak candidates rather than shortening the minimum required time in graduate training programs. There is a trend, at present, to shorten some of the training programs in surgery, which have traditionally been the longest programs, probably unnecessarily so. Fortunately, in my view, there is no tendency, at present, to shorten training programs in the primary care specialties (medicine, pediatrics, and family practice) since I believe that these require the broadest and most complex training rather than the most constricted.

Turning to the question of whether the dominant instructional techniques are likely to assure efficient and effective initial learning, and to establish in students the habit of personal responsibility for continued learning, I find it difficult to answer without being repetitious and I am not sure what the dominant instructional techniques are. The usual reference to classical graduate education in the humanities and sciences as the model for individual responsibility and self-directed learning is applicable to medical education only to a degree. The graduate student has an identified thesis advisor, his field of study is relatively narrow, both student and adviser have a common field of specific interest, and there is focus on a specific research program as a unifying force. Medical student education is far more complex and far more variable, particularly when selectivity and multiple tracks are emphasized. One great difficulty in this approach has been to identify, in the medical faculty, the analog of the thesis adviser. It seems clear that no medical student will consider the library, the computer terminal, or the self-assessment examination, as sufficient, and that the need for student-faculty interaction is deeply felt. One hopes that it is no longer necessary to state that a lecture which simply transmits readily available knowledge is a waste of time. Before dismissing lectures out of hand, it is necessary to define lectures about what and by whom. A lecture designed to consolidate a broad and complex body of information, given by an individual who can direct student attention to the critical and fundamental principles to be found therein, and who can do so with clarity of thought and precision of language, is a very exciting event indeed.

In the clinical years, undergraduate and graduate, the dominant technique will continue to be, as I believe it should, direct contact with the patient and a great amount of independent study about the patient. The effectiveness of this educational experience, as indicated before, will depend upon the patient base, the type and quality of the clinical setting, the numbers, types, and quality of the teaching faculty, and their time availability for teaching. Student and faculty interaction is perceived as critical by the students, and the most commonly expressed need by students in the clinical years is for more teaching and a greater opportunity to present their views to a faculty member.

Concerning the question of whether the evaluation practices presently employed are those which will provide suitable data upon which to base judgment about professional competence, one must separate the fund of knowledge, technical skills, and, most difficult of all, the "qualities of the physician." The introduction of innovative curricula and the emphasis on selectivity and independent study require evaluation instruments to assure the faculty that its educational goals are being achieved and to assure the students that their progress is appropriate. I am concerned that in many institutions the attention to evaluation has imposed upon the students a return to the era of too many examinations, albeit "learning examinations, not for credit." I am also concerned about unnecessary duplication of effort and wasteful expenditures of time and money if each institution develops a large number of evaluation instruments which are only locally significant. I believe that greater use of high quality evaluation instruments developed on a national scale and shared by medical schools is more likely to be efficient and effective. Much needs to be done to identify the critical elements to be evaluated in the direct observation of students in the clinical arena and to arrive at a greater degree of standardization on in this important segment of evaluation. I believe firmly in national standards for evaluation of professional competence, since physicians are highly mobile and existing licensing procedures permit great latitude in professional activity.

I might state that I have been, and continue to be, impressed with the quality and professionalism of the examination procedures of the National Board of Medical Examiners and that I believe that many of the specialty board, often working with the NBME, have made much more progress in using modern evaluation processes and techniques than they have been given credit for.

Is there a need for establishing systematic faculty development programs which address specifically the professional knowledge and skills of education?

I am much more concerned with a systematic program to assure the development of the new and different types of faculty who are urgently needed now and who will be needed in greater numbers in the future. One would hope that the development of such faculty would include the knowledge and skills of education. It certainly seems both necessary and desirable that each major component in the educational continuum should have an identifiable group of faculty and staff charged with the responsibility of educating the faculty as a whole about principles and skills in education as they relate to the faculty members' teaching roles, and also to bring to the institution newly developed techniques for improving the efficiency and quality of the education. Here, too, avoidance of duplication and sharing of knowledge and resources among institutions and organizations is desirable.

As a final comment on the general subject of the problem of programs, I would like to submit the following quotation from the Millis report:

> . . . the important point is that the nation cannot afford any weak medical schools. If practicing physicians with obsolete knowledge and skill are a threat to the quality of medical care for American citizens, medical school teachers with obsolete knowledge and skill will produce a whole generation of physicians trained for medical care at the level of a past age. We must put a floor under each medical school to assure a minimum quality of medical education. The alternative

> is to continue the present widening gap between the "have" and the "have-not" schools and to be faced with an unacceptably wide gap in the quality of their graduates. (Millis 1971)

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THE PROBLEM OF PROGRAM

Robert A. Chase, M.D.

Are we in need of extensive--one might say revolutionary--revisions in our programs for medical education? If not, is it because changes in the recent past have accomplished essentially what they were intended to effect? If so, is it because recent changes have done nothing, or even caused harm? Do we have the answers for any of these questions? If not, might we obtain them? Each question provokes another, whether or not it is answered, just as each bit of progress in our search for the way the human organism functions opens a door into new, vast, and complicated areas. I find myself focusing on the theme that if we only had the means to evaluate accurately and reliably what we are doing (or trying to do), including the end product of that process, our troubles would be fewer. In fact, there would probably be no need for this symposium. But we are here. We do not have the answers; so we must continue to discuss and, hopefully, make a little progress.

I hope you will pardon a brief reference to a summary of recent activities. Within the past generation, developments in the area of curriculum design and modification have included several significant aspects. Offices, departments, centers, or other resources for research and development in education are now recognized in close to 70 percent of our medical schools.

Moreover, in response to such stimuli as student unrest, faculty vision (or disillusionment), special (or specialty) interest groups, and Federal pressures, curricular revisions have been extensive. These have tended to incorporate one or more features, among which are integrated instruction; earlier clinical contact with or without correlation with basic sciences; a general reduction in exposure to both basic and clinical disciplines required of all students with or without a corresponding increase in number and scope of elective opportunities (without shortening total time and without shortening minimal exposure required); revision in the grading and/or ranking systems; a host of instructional innovations, incorporating such things as use of instruments for self-instruction and computers; and increased incorporation into formal programs of satellite clinical settings--preceptorships, outlying hospitals and clinics, foreign assignments (AAMC Curriculum Directory 1975-1976).

Many of these and other changes have been introduced to overcome what undoubtedly was a serious defect or weakness in the past, namely the absence of alternatives to meet different situations.

Let me offer a few strictly personal observations, some of which are based upon firm data, while others are probably not. Interestingly, in the period 1970-1975, 66 schools reported major changes (Cunnane, in press). Some of these may be seen in Table 1.

TABLE 1. Major Changes in Schools During 1970-75

	Schools	
Changes	Time Decreased	Time Increased
1. Time allotted for basic sciences	8	8
2. Time allotted for electives	10	17
3. Time allotted for interdisciplinary courses	8	10

Perhaps this era is beginning to level out with a desirable (or undesirable, but in any case inevitable) deviation toward the mean.

While there was, until fairly recently, a tendency toward shortening the minimal time requirement for the M.D. degree, part of this action may have been of questionable value, if not downright irrational or harmful. There is a paradox in the belief that one could direct attention to a rapidly expanding (in fact, exploding) volume of knowledge, skills, and other ingredients in a diminished period of time unless 1) The attributes necessary to do the job were receding, 2) The students were getting better or more knowledge on entry, or 3) We could get along just as well with a product of lower quality in terms of basic knowledge. Unfortunately, in trying to shorten the process by locating and eliminating what some thought were redundancies, we may have been squeezing out what was left of the students' opportunity for contemplative thinking and self-development--an essential ingredient of any educational program.

Another question comes to mind. Were many of these changes--some at least, and perhaps too many, were--introduced to respond to situations that would not endure? For example, was the shortened curriculum designed to stimulate an increase in the number of applicants when some schools were approaching the bottom of the barrel for applicants? Was the wave of student activism, which subsequently diminished, an overrated stimulus?

Could some of the changes have been based upon or supported by reports of experiences that were poorly controlled or reflected situations in educational populations other than those representative of medical students?

Perhaps too few curricular innovations were subjected to an appropriate form of evaluation to indicate objectively the degree to which change reduced harm or supported good, as was intended. Of course, this would entail human experimentation--a delicate matter at best. Is this because no appropriate forms of such evaluation were available?

Enough of that. My main theme is to glance at the program we might seek--call it curriculum, if you will--then move rapidly into one important feature of that enterprise which is evaluation of both process and product.

An ideal curriculum must offer an incentive to excel, must motivate the student to learn and develop relevant skills, and must arrange for a fertile environment in which student and teacher may discharge both incentive and motivation with minimum interference. No one can logically disagree with that "mother-love and sin" expression. But when we take students of differing ability and background who are heading for a variety of goals in differing settings, each requiring a unique set of appropriate skills, we run into problems. Add to those the variety of resources, both material and human, available to a given school, and the situation is further complicated. Despite all these potential disclaimers, however, there is strong support for the desirability of one important ingredient of recent curricular change, namely, flexibility. Flexibility is represented by both the options available in a given school and those emphasized to varying degrees in different schools. However, to this goal must be added the incentive to maintain within the overall structure of medical education enough rigidity to supply the skeleton necessary to keep it from collapsing, both individually and nationally.

Now to come to what I consider not only an important, but an essential, ingredient of program and curriculum, that is, the matter of evaluation. As I suggested at the beginning, if we had available a completely valid and reliable measure of either the process or the product of a program in all its dimensions, the job of designing that program effectively would be made easier. Lacking that instrument or technique, we must try to develop one. What do we want? What do we now have? How can we select and properly use what is available as we search for something better? These questions pose a final series of points I would like to discuss.

First, just like a good curriculum that arouses the incentive of a student and motivates him or her to excel, a good evaluation instrument must similarly challenge the student to both exhibit his or her best performance and to incorporate whatever is available to improve that performance. What may be a perfectly adequate licensure or permit instrument that, primarily and properly, incorporates a minimum standard to defend the public against gross incompetence, would not meet this criterion.

Second, an evaluation experience can and should be a learning experience. It can and should educate wherever possible, including more than by mental calisthenics alone.

Third, currently available nationally based evaluation programs have deficiencies. For example, they do not measure reliably all the attributes that to one degree or another are essential features of the product of a good program. Here, two elements must be kept in mind. The first is that one does not discard something that does one thing well simply because it does not do everything well. (One does not throw the violins out of an orchestra because they do not offer percussion, or the piccolo because it cannot operate in the bass range). One should not discard examinations that measure cognitive attributes (there is nothing inappropriate about a high level of useful knowledge) simply because they do not, of themselves, directly measure integrity, verbal communication skills, and a host of other factors. The second point is that, fortunately for music, we do have drums and tubas to blend with violins and piccolos; fortunately for medicine, there are means to attempt evaluation of such things as problemsolving skills and interpersonal skills, although they are not presently validated for use on a national scale, and they still need much improvement to make them effective in evaluation of small groups, or even an individual. At present, faculties must supply the latter by observation, checklist, behavior records, and audits. At the same time, faculty representatives and other professionals must strive, individually and in cooperation with groups including national agencies, toward better and more broadly applicable methods through research and development. Another deficiency in many currently available instruments is that they are not available for release to schools and their students for postexamination study (as educational tools in themselves). Review of an examination and discussion of its challenges can be an important feature of education, and national examinations, if they are to continue, must be revised to permit this use.

Fourth--after my ideas about program evaluation--is the observation that we continue to seek to define the good physician. Until we have an accurate, reliable, valid, and reproducible profile of that person, how can we correlate what we do have with that desirable end result? Here again, we need more accurate criteria upon which to base our measures of those who emerge from the programs on trial. "Core" was once the name of the game in new curricula, and "relevance" has had its run of popularity. The first term has almost disappeared; the second has declined. Today, the popular theme is "criteria for competence," and one seeks effective competency-based instruments, with good reason. Competence certainly does incorporate attention to every conceivable attribute--retention of the positive or good, and absence of the negative or bad. Are competency-based criteria identified? Yes, they are, at least to a degree. Can we now define the good physician according to these criteria? Probably not yet, but hopefully soon. Can we apply these definitions that are emerging to the entity we are trying to evaluate? No, but there is real hope for the future, and perhaps we can bring that future closer if we can combine our resources for research and development at schools, regions, and national agencies, and get on with the job. As a starter, we have already come a long way toward defining competency through strategies that are derived from subjective assumptions--the "consensus of experts," as well as of other more objective evaluators.

An essential ingredient in the process is to clarify the generic nature of the physician's role in modern society. Only then can we answer the question, What are we training physicians to do? In my view the physician's primary role must be care for the sick and the broad implications of that assignment. Yet, the physician simply cannot be responsible for overall health-encompassing social habits, the environment, and every potential threat to mental and physical health.

Physicians are specialists by definition who, to cope with the proliferation of relevant scientific knowledge alone, are further specializing within their major curing roles. While remaining aware of all important influences on health, they must contribute by doing what they uniquely do and do best. This is not to say that physicians should not play an increasing role in decisions pertinent to setting societal goals, but they cannot be held primarily responsible for them.

Obviously, physicians' roles have changed with the advent of new organizational patterns for delivery of care. A modern view of "what we are educating physicians for" necessitates a careful examination of what physicians do or should do in both traditional settings and the newer practice modes where a team approach to patient needs is organized. Integration of a variety of services by multiple providers working with patients and in their interests relieves patients of having to do everything themselves. Educational objectives in medicine must take such advances into consideration. Providers must be involved in developing objectives and in helping to provide authentic practical experiences for students.

The question of whether or not U.S. medical education in its entirety is educating to meet the nation's needs is difficult to answer. The push to increase the number (or percentage) of primary care physicians has generated a response, but whether our educational institutions under threat and/or incentive are responsible for the visible change in the number of students opting for primary care training is hard to say. Whose responsibility it will be to sustain physicians' interest in primary care remains to be seen.

In any event, physicians' credentials to be measured must be based upon information from many sources, including the educational program, judgments of peers and preceptors, and displayed performance in all areas. Testing organizations like the National Board of Medical Examiners have two serious obligations--to assure that test instruments are as valid and reliable as possible for use in measuring those components of competence subject to objective assessment, and to aggressively develop the various methods needed to evaluate objectively the competency components now beyond our reach. Meanwhile, we must not make the mistake of assuming we have available something that is still in the early stages of development.

Finally, evaluation of teaching and teachers is as important as evaluation of the program and the product. This may be attempted in many ways, through peer review, student opinion surveys, student performance on internal examinations, student performance on national examinations, and publications on educational strategy. Gessner (1975) and Rodin and Rodin (1972) have indicated that one cannot universally put faith in any of these measures since, at least in isolated instances, correlation among them is not necessarily high or even positive. The need for intensified investigation in this important area is rather obvious, particularly if one subscribes, as I do, to the need to recognize and reward good teachers. These are teachers who stimulate students, give them incentives to learn, and motivate them to excel. These teachers enhance curiosity in meaningful and appropriate directions. They inspire a thirst for knowledge, for answers to questions, and even the ability to stimulate the student to formulate independently the questions that need to be answered.

Our offices and departments of research and development in education are doing much, and possibly can do much more to generate the means for measuring effectiveness of teachers and eroding myths, if such exist.

In summary, if we can summarize a collection of rather loosely related points, I might state that, in this complicated and churning milieu we call medical education, we must not lose sight of those rather lofty and essential ingredients of programs that lead to what may be called a learning as well as a learned profession, one that is properly and effectively motivated toward an understanding of how the human organism functions; what makes it dysfunction; how to prevent, reverse, or even tolerate such dysfunction; and how to keep from becoming chaotic the subdivision of these matters, as well as to transform them into endless stimuli for learning and competency. In conclusion, we must continue the search for increasingly better ways to evaluate the progress and product of this system.

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THE PROBLEM OF PROGRAM

David D. Henry, Ph.D.

As a general university administrator or even a student of higher education broadly observed, I have some difficulty in determining what commentary may be considered common ground for the audience, participants, and planners of this symposium. I am mindful of the experts who are here--on the problems of programs in medical schools--as reflected in the expertise of a medical school dean, a professor of pediatrics, a medical examiner, and an editor and interpreter of the public interest in higher education.

My difficulty in determining relevant reaction is compounded by the insistence of the program planners that the participants hold to the outline of main questions as presented in the preconference materials. This is a tight rein on wandering commentators from different backgrounds, but obviously a useful device if focus is to be confined to selected issues. I probably will perform most usefully if I bring to those issues the questions that have come to my mind as I have considered the preconference material.

Foremost, I wish to sound a critical note. It seems to me that the program focuses on the medical school in isolation from the remainder of the university and upon the preparation of practitioners in isolation from other roles to be fulfilled by graduates of medical schools. In the same vein, I miss consideration of the medical profession in relationship to other professions and to social expectations. I recognize that the broader dimensions indexed by this comment probably could not be profitably examined in today's conference, but I trust that I shall not be out of order if the thrust of my remarks extends from my concern with some topics that have been either understated or omitted from the preliminary analysis of issues and problems as related to medical school programs.

To stay within bounds, however, I shall classify my comments under the questions that have been set down for our guidance, the first of which asks, Is the present organization and content of medical education suited to the preparation of graduates who will meet the most pressing health service needs of our society?

It seems to me that answers to this question will be dependent upon a definition of "the most pressing health service needs of our society."

For example, the growing involvement of government, at local, state, and national levels, in financing patient care and medical education, and in regulatory responsibilities, requires a continuing enlargement of the number of graduates who will be employed as administrators in carrying out government functions. We may deplore the trend toward greater government involvement in medical affairs, but the present priority for increased medical service established by public demand has great significance for educational planners. Educational institutions must face the issues and questions about improved preparation of people for the tasks that are now left largely to inservice experience, to dropouts from medical practice, and to laymen with limited backgrounds in the tasks that they are called upon to perform.

I do not have data at hand to describe the extent of the employment of certified doctors of medicine in these positions of public administration but certainly the question as to how they should be prepared is relevant to the study of organization and content of medical education.

I know that conventional wisdom suggests that nonpracticing doctors are not the concern of medical education, but I believe that this laissez faire attitude does not augur well for the future of medical practice in this country, or for the appropriate place of medical education in influencing the organization and administration of health care.

I am not suggesting that medical administration be made a significant part of the undergraduate or postgraduate program or indeed that there is room in the curricula for any formal education for preparation for nonmedical positions. I am suggesting, however, that the subject is one that should concern medical educators more than is readily apparent and that the problems, questions, and implications by analyzed rather than bypassed.

Second, I believe that we should also face up in curriculum design, both in organization and content, to the personnel requirements for academic medicine and for those who would choose research careers. It seems to me that an analysis of the place of graduate education in the medical curriculum should have significant attention. Under the present system, the Ph.D. in academic medicine without an M.D. is often penalized in the reward system and perhaps in the status system. Is this differentiation based upon a belief that medical education as now constituted is a necessary component of graduate education? If so, is there research support for this assumption? The reverse of this question is also relevant. To what extent is the researcher brought into intimate understanding of the problems of the practicing physician and into empathy with that doctor? Is the tension that exists between practitioners and academic personnel, both the teachers and researchers, helpful or destructive? If the latter, how can the situation be ameliorated?

Perhaps the most important element in defining an answer to the question of suitability of organization and content of medical education is with the response of graduates. The best authorities on the question should be the alumni. Obviously, the alumni audience will vary in reactions according to age, degree of success, personal adjustment, nature of work, and other variables. Nonetheless, it seems to me that we should not be as dependent as we are for an estimate of graduates' opinions upon the informal observations of faculty members, editors, and corridor commentary at medical meetings. A method for continuing, systematic, and comprehensive evaluation by graduates should be established.

Obviously, answers to the components of the first question will vary. If a single focus is impossible, would multiple emphases produce chaos or even strained resources? Perhaps the most we can ask for is an approach to the subdivisions of the opening question with a commitment to a flexibility that would take into account the needs of individuals, the areas of employment, and some broader base for continuing evaluation.

In any event, I think we must be clear that we are talking about multiple outcomes of medical education, not a single uniform pattern. Further, we should acknowledge that in defining "health service needs for a society" we are today talking only about medical education, not the health service needs as related to paramedical personnel and to allied professions. The latter topics would introduce substance far beyond our capability to assimilate in one meeting, but omitting them should not be interpreted as downgrading their place in meeting health service needs.

The second question before us asks whether an arbitrary time criterion for either basic or graduate education in medicine is still appropriate, whether a competency criterion is feasible.

As before, it seems to me that there are prior questions. The time criterion should be an outcome of program requirements, not the reverse. The question then really should be: Are the present substantive requirements for medical education still appropriate? Should there be more or should there be less?

Here the recent experience in considering a shortened time for baccalaureate education, commonly referred to as the 3-year degree, may be relevant. In many cases, the initial question for liberal arts and science curricula, as well as for some undergraduate professional fields, has invited an emphasis upon the time requirement rather than upon the substance. To me, this approach seems to miss the central point. In a time-shortened period to obtain a degree, if one merely compresses into 3 years what formerly was spread out through 4, as far as subject matter is concerned, some time may be saved for some students, but some benefits that come from more prolonged study in depth or scope may be lost. The fundamental question should be: What knowledge is essential to bring a student to the threshold of capability for dealing with the next level of educational experience? In medicine, the same question might be applied to clinical instruction--whether horizontal or vertical in curriculum organization. Answering this question really requires restructuring of the curriculum to meet an educational purpose rather than organizing the calendar to meet a time requirement.

The experience in England with the open university has been based upon consideration of determining what knowledge is essential to reach the level of educational achievement reflected in the baccalaureate degree.

Obviously, in today's world, with knowledge increasing at an almost incomprehensible pace, one can aptly say that 4 years is not enough for an undergraduate to acquire all the knowledge that might be expected from one's college experience. If 4 years were adequate in 1920, perhaps 8 years should be required now, or 10, or 12. The latter is clearly not feasible from any point of view. The approach to the question, therefore, requires a new look at the traditional curriculum.

It has been unfortunate, in my view, that in this country the question of the time-shortened degree has been approached from the point of view of time rather than from asking the question suggested above. Most advertised programs with time-shortened degree calendars are compressed 4-year programs, with summer sessions, or advanced standing, or subject matter examination equivalents from acceptable independent study.

The open-university degree in England, so much admired and so little understood, has been based upon the reworking of the subject matter from beginning to end, with independent study and counseling, seminar methods, and other instructional and organizational devices added. The materials produced reflect an entirely new organization and definition of instructional materials.

It seems to me then that the time criterion is irrelevant. What constitutes the essential elements of instructional material for basic undergraduate education? Perhaps the time required for that experience is 1 year, 2 years, or more or less. In any event, I believe that the question ought to be approached in this manner.

I would approach graduate education in the same way. In present practice, diversity is accepted. The divergencies among departments, insofar as time is concerned, within a single university are great. These differences also exist among universities. In the humanities, for example, the years required to meet the subject matter requirements and the research expectation are much longer than in the basic sciences. One can also find such differences among institutions. In short, there is a flexibility in graduate education today that is not characteristic of undergraduate education. This is not to say, however, that there are not excessive time rigidities at the departmental level; but they usually are not broadly institutionalized. The progressive department at the graduate level looks at the question of what knowledge is most valuable in terms of expectations for a doctorate.

The question of the feasibility of a competency criterion also raises a prior concern. One must ask, competency for what--to demonstrate a mastery of knowledge in certain subjects or to demonstrate a capability for applying knowledge in a way that is relevant to problemsolving in a profession? Or even, competency for both mastery and capability of application adequate for undertaking clinical training or advanced training? Competency for what must be determined before a competency criterion can be considered at all.

Another question: Are the dominant instructional techniques likely to ensure efficient, effective initial learning and to establish in students the habit of personal responsibility for continued learning?

I assume that the dominant instructional techniques would include lecture, discussion, and the use of teaching devices that enhance independent study, such as programmed learning, television, films, field experience, and a variety of visual aids. It is not likely, however, that techniques alone will "ensure efficient and effective initial learning." The teacher is at the heart of the process. If the lecture is pedestrian, inadequate in verbal communication, confined chiefly to information giving that could be gained more interestingly from books and other sources, the lecturer may be faulted. On the other hand, if the lecturer is an interpreter, gifted in applying knowledge to problemsolving and in relating knowledge to the level of student understanding and experience, it is the teacher who must be appraised, not the lecture technique itself. Similarly, group discussion may become nothing more than questions and answers in a recitation environment. An effective discussion leader, however, can stimulate a continuity of group thinking and incite participation that is stimulating to the entire membership. Similarly, there is no magic in the mechanical or electronic devices. The magic is in the mind, spirit, and artistry of the instructor.

In considering the third question, then, it seems to me that the answer lies not with an evaluation of techniques so much as of the quality of instruction. How can quality be encouraged, how identified in the recruitment of new faculty, and how may the tools for effective teaching be made available to those who are gifted in their use? The responsibility here lies with the recruitment and appointment process as much as it does with techniques.

The capacity for establishing in students the habit of personal responsibility for continuing learning also goes to the teacher rather than to technique. However, the predisposition for taking responsibility for continued learning goes to the admissions committee. Students must be motivated if they are to be subjects for continued learning. Intellectual curiosity, professional ambition, and purposefulness are elements in their motivation. Students must be willing to be assisted in taking responsibility for continued learning. The reluctant student or the student uninterested in learning, except for purposes unrelated to professional values and outcomes, cannot be affected by the most inspiring of teachers or by the dominant instructional techniques. I believe that student selection and faculty recruitment are the main centers for attention in dealing with this question of instructional techniques.

Too, there are factors in the education of students that are not part of formal instruction. The process of professional socialization is a great teacher. The environment, including peers, the modeling for identity, and the immersion in a controlled setting shape students' views and even modify their skills. Says William Toombs, "This orientation of personal values, attitudes, assumptions, and behaviors, along with the careful development of elaborate cognitive, linguistic, and, where necessary, manipulative skills probably makes doctoral study, one of the most powerful examples of adult socialization, all the more striking because both entry and continuance are essentially voluntary." (Anderson 1974)

Turning to the fourth question: Are the evaluation practices presently employed those which will provide unsuitable data upon which to base judgment about professional competence?, brings to mind a story.

The dean of a college of law has been quoted as having said that the graduates of his school with records of A became professors, those with records of B became judges, and those with records of C became prosperous practicing lawyers.

I do not vouch for the authenticity of the dean's observation, but the account tells us that there are different competencies even among those in a fairly narrow specialization and that academic success is variously related to certain kinds of professional outcomes.

I am not a student of evaluation practices, as presently employed in colleges of medicine, but I have observed that the faculty members have used the almost universal practice of grading subject matter in terms of content mastery. What the correlation is between such mastery of subject matter and professional competence would depend upon the definitions of professional competence. I doubt that there is a single definition or a uniform pattern of expectation.

Quite generally in the academic world, the relationships between academic grades, professional competence, and personal outcomes in postdegree life have not been broadly and scientifically established. Even where generalizations are feasible, one must allow for individual variations so numerous that any generalization is subject to so many exceptions as to be at once considered invalid.

I am not suggesting that evaluation is not worthwhile. Quite the contrary. I am suggesting that the objectives of evaluation should be clearly and firmly established through research and that its relationship or lack of it to any other expectation should be made explicit to students and public alike. If we do not know what constitutes effective teaching, let us not pretend that we do. Let us say simply that what we are doing appears to have worked in most cases and that is all that we know. Let us apply to our own professional behavior the same scientific standards that we would apply to the laboratory experiment.

The last question was: Is there a need for establishing systematic faculty development programs which address specifically the professional knowledge and skills of education?

I believe that the answer is yes, not only for colleges of medicine but for colleges throughout the university world. It is somewhat ironic that we have undertaken the business of preparing people for nearly all the professions that are based upon the college experience except that for college teaching. Here we take the certification of learning experience and academic success in undertaking a research program, and employ a person for teaching without any specific objective measurement of capabilities for classroom performance or examination of what that person knows about the art of teaching or the science of teaching. The approach is even more primitive than the teaching of medical students as apprentices through practicing physicians. The apprentice at least had an opportunity to observe and to learn to appreciate the art of practice as well as the substance.

I do not mean to overgeneralize. I know of the effort made in the direction of staff development at the University of Illinois and in some other places. However, the utilization of interdisciplinary assistance in the preparation of teachers at the college level is minimal.

Most of us as young teachers were given the privilege of teaching by whatever methods we had observed--some obviously poor, some obviously good. What seemed to work for anyone of us, however, might not work for others. We went on practicing what we thought was good without learning much about anything else. As an apprentice, I was handed a textbook, a course outline, and a classroom full of students. Many of my peers had the same experience. Today some inservice supervision and training is organized for younger apprentices, particularly the graduate teaching assistants. By and large, however, we have not made much progress in introducing what is known about success in teaching into practice at the collegiate level.

Indeed, we do little in preparing academic professionals to become members of faculties or to understand faculty responsibilities beyond teaching. The university is a social institution, a highly complex organization, different from any other kind of social institution. Faculty members will in all probability spend the remainder of their lives in such an enterprise. Yet, they are given no perspective on the history of higher education; its purpose; who pays for it and why; its philosophy; its problems of organization, structure, and governance; and its place in the scheme of things socially, politically, and philosophically. Here, all institutions have a lot to learn. But the beginning place is at the departmental level, because it is here that the teachers of tomorrow are recruited.

In conclusion, I list a number of questions that might form the agenda for another symposium but to which we might give some side-glances in the discussions at this conference:

- What is the proper role of accrediting in curriculum making?
- Who is to monitor evaluation practices as applied to student achievement, faculty performance, admissions, promotions, and appointments?
- How is the academic establishment best organized to contain improper or inappropriate intrusions upon curriculum making from government, from external pressures (often conflicting), from accrediting agencies and licensure and professional boards, and from political influences?
- What is the extent of impairment of quality arising from capital deficiencies and inadequate financing?
- How may students and faculty best be sensitized to social needs, professional ethics, and public expectations?
- What priority should be assigned to the continuing education of the members of the profession?

- Are the educational resources of the university as a whole imaginatively and effectively utilized in medical education?
- What should be the responsibility of the college for the education of the intern and the resident?
- Should basic science and clinical instruction be tied more closely together?
- Is the recommendation of the Carnegie Commission on Higher Education (1970) for the establishment of a midpoint degree between the A.B. and M.D. feasible and educationally sound?

This random list of topics, related to formulation of programs in medical education but only tangentially included in the lead questions of this session, is only suggestive, not exclusive or comprehensive. It does show, however, the complex nature of the task in building an education program that brings the graduate to the threshold of practice, adequately prepared, professionally motivated, and qualified to become self-educated in the changes taking place in medical knowledge and in the organization and delivery of health care in the nation today.

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THE PROBLEM OF PROGRAM

Critique and Challenge

Fred M. Hechinger
Discussion Initiator

Mr. Fred M. Hechinger: I feel like the only civilian assigned to ask critical questions of the General Staff about the workings of the honor code at West Point. If my colleagues on the panel seemed inclined to praise doctors, I hope they will not interpret some of my questions as suggesting I want to bury them.

Let me start with a simple question that occurred to me in the last stages of Dr. Henry's address. Since it was essentially the university professors who fought so violently in the 1950's against the teaching of teaching skills for the elementary and primary schools, how much of a chance do you think there is that the same university professors will consent to a system of teaching teaching skills for the medical schools?

Dr. David D. Henry: In the long run, I think we may have to wait until the present generation vacates the chairs and a new generation comes on board. Then, persuaded by financial circumstances, by increased complexities in education, and by greater concentration on their own responsibilities they may yield on the point. And I am being more than facetious. Higher education has become so complex that we can no longer treat it as if it were a simple matter. Faculties will come to recognize the importance of effective teaching and the need for evaluation and public accountability. It will be slow in coming but this philosophy underlies most of the university programs in the teaching of higher education today. It will take time for all the present biases to disappear and for new people to move into positions of influence.

Mr. Hechinger: Although I do not profess to know anything about the subject matter of medicine, what I heard today about curriculum was not unlike discussions I have heard in the past about curriculum in elementary and secondary schools. These usually dealt with the teachers and the administrators and the institution but rarely dealt with what the program did for the children. The changes in curriculum described this afternoon seem to relate little, if at all, to how they would alter the way in which graduates would deal with patients. And I must ask whether there can be in the curriculum some specific provisions for fostering the sensitivity of physicians to both the medical and nonmedical needs of the patients, their fears, their relationships not only with a doctor but with the doctor's office staff who often prevent patients from seeing or talking to the one whose help they seek, and with the hospital personnel who frequently make patients unhappy or afraid. Are you thinking of any specific approaches to teaching students these things?

Dr. Irving Schulman: I think most medical faculty recognize that the physician we want to produce and the physician patients want to see must have these qualities. But to attain this goal requires a personalized education. Large classes, too few faculty, and no role models almost destroy our best efforts. Such a goal also requires reliance on other disciplines, particularly the social and behavioral sciences. This is why I am so concerned about divorcing the medical school from the rest of the university, and building medical schools away from university settings. I think we know we must realize this kind of education; there is no question that students insist on it. But mass education depersonalizes the patient care experience and this is my greatest concern. Another concern is whether personalized education can be treated in a formal manner. It is being attempted to a degree through the introduction in the preclinical years and early clinical years of programs dealing with the ethics of medicine, the dying patient, the chronically ill patient, and many of the things that in the past we assumed would be learned. I think issues such as these should permeate the entire educational process.

Mr. Hechinger: What troubles me in that answer is the fact that the people who now do the teaching came out of a generation that did not have to be concerned with these issues, and, therefore, perpetuated this lack of concern. Or, to take a specific instance that Dr. Henry cited, the relationship between patients and the doctor, in the hospital or in the doctor's office, may be damaged by the lack of administrative skill in dealing with the action of a nurse, or a secretary, or whatever other echelons stand between the patient and the physician--including the telephone-answering service. And yet there is apparently little being done to include this kind of emphasis in teaching new physicians.

Dr. Robert A. Chase: I think there is something common to both questions you have asked: It has to do with incentives. To the extent that faculty members remove themselves from patients and patient care they simply cannot provide examples of the things you are talking about, and there is a disincentive to being involved in patient care and in teaching as well. Unfortunately in the current academic marketplace there is no reward for either of those things. Until the criteria used to judge faculty for appointment, promotion, and tenure and all the rest are modified, it is unlikely that things will change very much. The excitement of teaching is a personal incentive but the rewards come for doing other things.

Mr. Hechinger: To what extent will an incentive be created by rising consumer dissatisfaction? For instance, the general revolt among women and the backup of that revolt by the women's movement has made a substantial difference in the relationship between medicine and women. Will it be necessary for the general public to resort to the same kind of organized pressures to bring about this change?

Dr. Robert H. Ebert: I think you have asked a difficult question. It has already been said that in the process of medical education, in the process of professionalization, a physician really loses sight of these things. He or she becomes part of the system, and it becomes hard to see what is really happening. I once suggested to a group of students that when they go into the hospital for their first clinical experience, they take a close look because they would never see it in the same way again. In going through this clinical educational process students often overlook the sorts of things that only patients can bring to their attention. It is my firm conviction that the only way this will be altered is through interaction with consumers. I do not believe it can be taught in any formal fashion and I doubt that faculty can teach it if they are not involved in it.

Dr. Chase: There is one other person who can bring this matter to our attention: the student.

Dr. Schulman: I think we should remember that the medical student is also a consumer. Many of the changes we think we ought to initiate have been done by students before we have begun to initiate them. The students, more often than we give them credit for, bring to our attention the changes that are needed. And if faculty members stay out of the way, the change may take place.

Mr. Hechinger: Before I move on to another question which may also seem difficult, let me assure you that some of my best friends are doctors. If it is true that desire to serve society is at least one of the motivating factors for many young people who flock to the medical schools, then do those schools have a special responsibility to work toward preventing such incidents as the recent medicaid scandal, or the whole issue of unnecessary surgery? These examples may involve only a minority, but still a substantial minority of the profession, and in one sense these are problems of medical practice as a whole for they go beyond personal integrity, raising the issue of responsibility for peer review of professional behavior. What curricular provisions do you think ought to be made to deal with this whole area of medical ethics?

Dr. Schulman: Some of the questions you raise are simply not answered by curriculum changes alone. We might also go back to some of the things discussed this morning and particularly to the admissions process. We know that a student who gets into medical school is probably going to graduate but we have an important responsibility during the process of medical education to weed out those who do not exhibit the qualities of a physician. After graduation we must have continuing peer review of performance. People do change, and when a doctor changes that may be quite dangerous. I believe we must accept peer review. But peer review must be more than looking at each other--it will have to become a system in which the public has confidence, one that assures continuing knowledge and professional competence as well as ethics.

Mr. Hechinger: Your overall approach to the problem somehow seems incompatible with the vivid description given by Dr. Gellhorn of the way students get into medical schools through a kind of competition that forces a substantial number of them into unethical practices to meet admissions standards. To what extent can the medical school counteract a psyche that has been conditioned to doing things for personal gain and survival rather than for service to humanity?

Dr. Schulman: With apologies to Dr. Gellhorn, I think that idea is overdone. Students do work hard to get into medical school, but I have served on the faculty of five schools and I do not see a perpetuation of this grubby infighting, cut-your-throat thing in medical schools themselves. Medical students today are remarkable young people and I rarely see the personality characteristics to which you have alluded.

Dr. Ebert: I must agree with Dr. Schulman. I would say the biggest problem we have is not competition but that students do not want to be graded at all, and for the good reason that they want to help one another. I have the feeling that we may be getting a different kind of person into medicine today.

Mr. Hechinger: If it is true that the majority of students enter medical school with relatively less background in the social sciences and humanities than other students, should something be done in medical school to influence the future political and social conscience of the profession? To be specific, in the past organized medicine has tended toward conservatism in matters relating to the social progress of medical care. While that may or may not result from the limited premedical preparation in such areas as economics and sociology and government and history, unless the medical schools do something through their educational programs or even through a study of their own organizations, what chance is there to make the total profession more varied in social outlook?

Dr. Ebert: Through the work of such investigators as Funkenstein, we have a fair amount of evidence about the value systems of medical students during the last 20 years. It is clear that their values are relatively uninfluenced by what happens to them in medical school. They seem to reflect much more the general value system of the time. For example, in the early 1960's roughly 10 percent of the entering and graduating students thought national health insurance was appropriate and perhaps 10 percent thought they ought to work on salaries. Today a substantial majority of entering as well as graduating students favor such things. In other words, all of the manifestations of a more liberal and enlightened view of medicine seem to have developed before these people even got into medical school. I wonder whether the medical school itself is going to make much difference, whether these views instead reflect values acquired in college, or from the prevailing spirit of the time.

Mr. Hechinger: In that case, you do not feel that the lack of instruction in those areas, for substantial numbers of premedical students, ought to be corrected?

Dr. Ebert: I believe I would ask first whether students who enter medicine have values substantially different from those who go on in any area of science, or from those who do graduate work in the humanities? In other words, is this situation unique to medicine or is it really a description of what happens in college?

Dr. Edmund D. Pellegrino: It should be noted that a recent survey revealed 98 medical schools now offer some formal instruction in medical ethics. This is a remarkable change from a decade ago when you could scarcely find anyone discussing the subject. Specifically with respect to the humanities, broader engagement between some of the humanistic studies and disciplines and medical education is also occurring. There are also 30 formal programs now which deal with the humanities in medical education, and another 15 are in the planning stage.

Mr. Hechinger: On one specific issue raised by the panel today, is there anything the educational program might do to produce more physicians for the now underserved urban slums or rural and small town areas?

Dr. Schulman: Are you speaking about the need to expose medical students to these problems, or to create a system which places graduates in underserved population areas?

Mr. Hechinger: What I am really asking is whether there is something in the educational program that can cope with the problem. Is there an educational alternative to overproduction or governmental fiat?

Dr. Chase: I think I understand what you are driving at, but I believe that both geographical and specialty maldistribution must be dealt with at a level beyond the medical school. The incentives for individuals to choose particular specialties or areas of practice have little to do with the medical school curriculum. Now I am not completely absolving the schools of responsibility, because, obviously, one contribution they might make is to establish models different from the super specialization that is now so prominent. It is hard to find a general practitioner within most medical schools. So there are things that can be done but, as long as the current reward system remains, it will be hard to stimulate medical students to make those choices. And I am not even sure that different models would change things. As someone has said, "How can you keep them down on the farm, once they've seen the farm?"

Dr. Ebert: I think there are more things that can be done than we may be doing. First of all, it is important to avoid making any experience of this kind required for that is the kiss of death. We have found that a great many of our students are looking for opportunities to serve in rural areas both here and in developing countries. In those developing countries they often learn a good deal more about this country than they might have if they had looked here. I am convinced that experiences of this sort do influence how students perceive problems. Whether they will alter career choices or practice settings is a still unanswered question, but we should at least provide these opportunities.

THE PROBLEM OF PROGRAM

General Discussion

Participant: From Dr. Schulman's presentation, I understand that there are deficiencies in some U.S. medical schools today but from Dr. Chase's presentation I understand that the National Board of Medical Examiners assures that all medical graduates are qualified. Are these two positions consistent? As a premedical adviser, can I advise students to go to any school in our country or must I caution them about some of them?

Dr. Irving Schulman: I do have a great concern about the quality of medical education in some American medical schools and, therefore, about the quality of their product. The National Board of Medical Examiners measures primarily cognitive things. I think we can certainly say on the basis of National Board performance whether students have attained an acceptable level of knowledge. What concerns me is that there are other attributes of a physician which at the moment cannot be measured on such examinations and which must be assessed if we are to turn out the type of physician about whom Mr. Hechinger was speaking.

Dr. Robert A. Chase: I agree with that statement. Dr. Schulman is quite right that it is only in those now measurable components of competency that we evaluate students: their store of knowledge and to some extent their problemsolving capabilities. By utilizing such examinations, we protect the public against incompetence in those areas of competence that are objectively measurable.

Participant: Perhaps I have misunderstood, but I thought Dr. Schulman stated that there is an enormous variation among programs in the 117 medical schools and Dr. Ebert said there is a remarkable similarity among them. Perhaps you would try to reconcile that apparent contradiction.

Dr. Schulman: I tried to point out a great similarity in goals among the 117 medical schools, but the tools with which they try to achieve those goals vary widely. Many schools may state that they have elective programs or multiple tracks but an elective curriculum really requires an exquisitely sophisticated student counseling and guidance system. Without that an elective curriculum is really a sham because students simply float around with nobody to help them.

Dr. Robert H. Ebert: Well, I really meant what I said. I think there is little difference among medical schools in this country. In spite of all the so-called modifications, the curriculum has remained remarkably stable for the last 65 years. At the Harvard Medical School the curriculum changes on the average every 7 years, and it swings back and forth between more required work and more elective work and has for the last 6 decades.

I would also note that the data collected by the American Council on Education, the Association of American Medical Colleges, and the Rand Corporation for the President's Biomedical Panel revealed a number of interesting things. For example, in the course of looking at the impact of Federal research support on medical education and universities, they discovered that medical curriculum had almost no influence on the choice of career. The choice of specialties was no different in the research intensive universities than in those less so. Neither did the research environment have any influence on the development of primary care residencies. About 10 percent from research intensive universities and about 6 percent of graduates from other schools go into academic medicine, but this seems to be determined more by the student's background than by the curriculum. So I would say that despite what may superficially seem to be substantial differences, there is a remarkable similarity among our schools and a remarkably even product as measured by examinations.

Dr. Chase: I think both Dr. Schulman and Dr. Ebert are correct. Schools are both similar and different depending upon the yardstick used for measurement. For example, looking at examination results, U.S. and Canadian medical graduates perform at an exceedingly high level compared with graduates from many medical schools in other parts of the world. On that scale, these North American schools are quite similar. On the other hand, within that high range of performance there are detectable differences but, because of the restriction in range, the differences are probably not educationally significant. It is for this reason that the National Board will no longer report school rankings, for it seems to me a ridiculous exercise. We will continue to report performance in relationship to the curve of a highly selected and purified reference group of students.

Participant: You have suggested that faculty members provide not only instruction in the content of medicine but also a model from which students learn both values and the practice of medicine. If you were planning new educational strategies to meet some of the problems that have been identified here, would you deal first with faculty behavior, curriculum structure, or the examination system as the most promising vehicle for change?

Dr. Ebert: It is interesting to me that at least at Harvard there is widespread student rejection of most of the faculty as models. Students seem to think that none of them are good enough. And that is probably for the best. I think the real modeling probably gets into high gear during the residency. I doubt that any modification of the medical school curriculum or alteration of examinations or anything else is going to change that. At its best this hospital period of professionalization produces a resident with dedication to patients that is laudable; at its worst it produces an arrogant individual who thinks that anybody outside the profession, and more particularly outside a given specialty, has nothing useful to contribute to medicine or to medical care. Unfortunately whatever the outcome, it has nothing to do with what is consciously taught.

Dr. Chase: I do think faculty models are important. The kind of model, however, is really a question of institutional priorities. In other words, given the choice, is a school likely to choose for faculty appointment a potential Nobel Laureate or a person who will become a superior clinical physician? I believe there is a place for both. As far as examinations are concerned, you suggested that possibly these could be effective change agents. I do think that such examinations as the National Boards have an effect on curriculum, and faculty sometimes complain that this is so, because those examinations are made up by the 108 medical school teachers and investigators who form the National Board test committees. It is they who decide on the thrust and content of those examinations.

Participant: Dr. Ebert suggested the desirability of giving an M.D. degree to an essentially undifferentiated blast cell that would differentiate after graduation. This may be desirable but it obscures the strong pressures and intra-institutional competition for time and attention to three different career possibilities: the clinical practitioner, the laboratory research worker, and the clinical investigator. I wonder if the panelists might comment on the balance among these three objectives in undergraduate medical education as it now exists and as it might be in the future.

Dr. Schulman: There is no fixed formula. Students should have during medical school the time, as well as the supervision, to become involved in all of these things. If the curriculum is so filled with required activities that the student has no time to spare, that student will never learn about the principles, the philosophy, the techniques, or the value of research or of clinical investigation. I believe not every student should do research, but the curriculum should allow opportunities for students who become interested to test this way of life. I cannot identify a balance in the undergraduate years between research and patient care. I think perhaps the blast cell idea goes a little too far. We are seeing some tracking and earlier differentiation than existed before, but I have great concern about requiring selection of a track before students have had the opportunity to decide which track they actually prefer.

Dr. Ebert: I would agree essentially with what Dr. Schulman said. There should be many opportunities provided, and this is one of the reasons for some elective time. Unfortunately, when you make everything elective, most medical students will devise the most rigid kind of curriculum because they do not want to miss anything.

Participant: Does the panel know of any country that has solved the problem of maldistribution of physicians in any permanent way except through coercive methods or financial incentives?

Dr. Ebert: I attended an international conference about 2 years ago in which there were representatives from the United States, Canada, Australia, Great Britain, France, Poland, Yugoslavia, Russia, the Scandinavian countries, and others. All reported major problems in the distribution of care and particularly in getting physicians into rural areas. And so the answer is really "no," with the possible exception of China.

Dr. Schulman: In speaking with a senior officer of the health system of China, I discovered that he, too, is beginning to feel concerned about China's ability to maintain the present system of equitable distribution. As young people become more aggressively independent, it becomes harder to get them to go where the society thinks they ought to go. And that can trouble us here as well because even if we require graduates to go to underserved areas, how long will they stay there, how angry will they be at having had to do it, and how will that influence the kind of care they will provide? I worry about bribery and coercion as tools to alter distribution because in the end the patient may suffer.

Dr. Chase: Our educational system has now generated a large number of students who have opted for training in primary care. My concern is who will be responsible for keeping them in primary care and keeping them in underserved areas. For this reason I think the incentives have to be changed.

Participant: The panel has discussed the attempts to adapt curriculum to changing needs, but has there really been any fundamental change in the content of undergraduate medical education? Medicine is still being taught as a compendium of specialties, is it not? If this is the case, can we really expect an enduring commitment to the general kind of practice that we think more medical students should choose if every aspect of their education from the learning of pathophysiology to the role models, to the organization of the school, is a synthesis of specialties?

Dr. Schulman: You have posed at least two questions. Concerning the organization of teaching, I agree that medicine is still being taught as a group of separate specialties. However, as far as content is concerned, there is clear evidence of significant change. If you look at the National Board examinations or textbooks of medicine of 10 years ago and today, the change is dramatic but I am not sure that that addresses the issue.

Participant: Does the content change reflect the change of the science of medicine?

Dr. Schulman: Yes, it does by and large. But I think there has also been content change in other ways. For example, even though taught as a series of specialties, what is taught within each specialty is constantly changing and the greatest changes are taking place within the so-called primary care specialties.

Dr. Ebert: I would like to comment on the preclinical years. It does seem curious, in a time when biological sciences are undergoing rapid advances, that we should cut back on the amount of time devoted to them. This may be much more important than the time devoted to clinical instruction during medical school because there is a long period of further education in that area.

One more word. Let's be honest. Medical teaching is becoming more and more subdivided as people become more specialized. There are, for example, no longer many good models in general internal medicine. The subdisciplines seem to proliferate at a tremendous rate and each now opts for a certificate of special competence. Each one also sets up a special teaching program and medical students get thrust into each for very short periods. Levitt's tracking study showed that among those in the class of 1960 who were certified in internal medicine, 38 percent of them went for subcertification in some area; in the class of 1968, the comparable group was 55 percent. If we look ahead, among those who already hold their Boards in medicine, 70 percent are opting for subspecialty certification. I find nothing wrong with specialization but I do have great fears about the impact of certification in each of these special subdisciplines.

Participant: I understand your views about offering rewards for teaching, but what if most staff are full-time physicians but part-time faculty members who are really not interested in achieving tenure or any of the other usual faculty rewards. How do you get them to take part in curriculum evaluation, or the evaluation of their teaching?

Dr. Ebert: First of all, I must say that medical schools have not done very well in evaluating the teaching ability of their full-time faculty, quite aside from their part-time faculty. For the most part, faculty are judged on the basis of their research productivity. If I were to estimate the level of concern about teaching at Harvard University, I would rank the law school and the business school first, the faculty of Arts and Sciences at the undergraduate level next, and then perhaps the medical school. The lowest in rank would be the graduate programs. I do think there is a great deal we can learn from those who really have devoted a significant amount of their time to the evaluation of teaching and the mechanisms for rewarding excellence.

Dr. Schulman: But the question was also, What do you do if a majority of the faculty are part-time people in practice who are not interested in teaching? Now the issue is, Why should they be in a medical school? But even the desire to teach may not automatically make them good teachers.

Dr. Ebert: Well, I must say that our experiences are about the reverse of that, because our part-time teachers probably do as much teaching as any one.

Dr. Schulman: Please don't misunderstand me. I do not mean to imply that the physician in practice who teaches part time cannot make an important contribution to medical education. What was described here was a situation in which a group of practitioners was assigned a substantial role for medical education was reluctant to carry it out. That is a dangerous situation.

Participant: Two indictments have been leveled at curriculum design in medical schools: first, that the process of educating medical students tends to make them disease rather than patient oriented; second, that the clinical experience is a model of cross-sectional and episodic rather than comprehensive and continuing medical care. I wonder if any of the panelists would respond to those two criticisms.

Dr. Ebert: Let me answer the second part first. I think it is difficult to offer anything but an episodic clinical experience as a simple matter of efficiency. It is hard to provide continuity because the periods are brief and priority is given to varied experience. The most effective way to accomplish this is in the hospital which is also a much more controlled environment. I think the greater indictment should be addressed to the residency years which remain episodic and oriented to acute problems. Clearly that could, and should, be changed.

Dr. Schulman: I agree with Dean Ebert that although the hospital as a base for training may not be appropriate in some respects, it has special value at that stage in the student's education when there is a need for time to think. This time is usually unavailable in an ambulatory setting. The hospitalized bed patient allows the student to learn many of the things we have talked about: How do you use a team, who are all these people who deal with patients, and what do they do for a living? It also provides time to go to the library, to come back, and discuss the problem with staff. At that point in the student's education time is very important. When you put an undergraduate medical student into an ambulatory setting, you may destroy the very things the student is there to see: Patient care becomes inefficient, the patient waits too long, and the student begins to learn an impersonal high-cost care method which is absolutely opposite to what an ambulatory setting is supposed to be. Later on, during the residency years, we can focus upon continuity, economics, efficiency, and the doctor-patient relationship in an ambulatory setting.

Dr. Chase: I would respond to that in another way. We must spend more time listening to students. They are often critical of the way faculty manage patients as people, not so much the way they manage diseases. I think we need not worry too much about not teaching students concern for patients, but we must listen more carefully to make certain we are not doing anything that destroys such concern.

Background Paper

3. THE PROBLEM OF COST

To grapple with the extraordinarily complex problem of cost, one may find it helpful to begin by noting that in 1972 this Nation invested about 7 percent of the $1,152 billion gross national product in all of education; 2.7 percent, or approximately $21 billion, in higher education. Of this amount $3.1 billion went to education for eight health professions (medicine, nursing, dentistry, pharmacy, osteopathy, podiatry, optometry, and veterinary medicine). Approximately $2 billion, or 63 percent of this total, was designated for medicine. More than half of these dollars were derived from grants and contracts awarded for specific purposes. This meant that less than 50 percent was allocated to general operating support. Well over one-third of this amount came from State and local government appropriations. The second largest source (about 16 percent) represented recovery of indirect costs of sponsored programs. Third (just under 16 percent but growing rapidly) was medical school revenue from professional fees (medical service plans). Only 10 percent of the general operating costs were derived from tuition and educational program fees. Since 63 percent of the total expenditures and 45 percent of the operating budgets were derived from Federal, State and local governmental sources, it is clear that taxpayers provided the major support for medical schools whether public or private.

The question that plagues those who attempt to understand the implications of these figures is how to allocate costs within the expenditures. It is generally agreed, for example, that the direct cost of instruction represents only a part of the real cost of educating health professionals. Faculty members, whose salaries make up the largest part of the educational cost, not only engage in the tasks of teaching (direct instruction; teaching preparation; and curriculum, instructional, and evaluation materials development), but also provide patient care which is essential to the educational program, engage in research that enriches their own capacity to teach as well as the substance of their instruction, and take part in general activities that support the educational enterprise (administration, community service, professional development, and writing). They also do some of those things as part of the broader mission of the medical school, independent of the contribution to a basic educational program. In attempting to allocate costs an arbitrary but generally accepted convention is that basic science department faculty members should, in fulfillment of their educational responsibilities, give 35 percent time to direct instruction, 40 percent to research, and 25 percent to other supporting administrative, scholarly, and professional activities. In clinical departments, 35 percent of faculty time should go to instruction, 25 percent to clinical work, 15 percent to research, and 25 percent to the other kinds of activities which are essential to education. Using the actual amount of time individual teachers give to the direct instructional task, one can then prorate the cost of the other activities which support that educational mission.

Based upon such calculations, two recent studies of a representative sample of medical schools have produced quite different cost figures. The Association of American Medical Colleges Study Committee concluded that the annual cost per medical student ranged from $16,000 to $26,000. The Institute of Medicine of the National Academy of Sciences found the average annual cost per student to be $12,650 with a range from $6,900 to $18,650. When broken down, the latter average figure yielded $7,650 for instruction; $3,250 for research; and $1,750 for patient care required to support the educational program. By contrast, the average annual cost in dentistry was $9,050 (of which approximately $8,500 represented instructional cost); in diploma nursing programs, it was $3,300 per student per year; and for baccalaureate degree nursing programs, it was $2,500 per student per year.

Salaries represent the largest single cost item in medical school budgets (faculty alone account for 43 percent of that cost). The average number of full-time-equivalent faculty members per medical school is 366 (with a range of 217 to 662) which provides an average faculty-to-student ratio of 1:1.3 (and a range of 1:0.9 to 1:2.7). The average time given by each teacher to the instructional program was 18 percent (with a range of 13 percent to 30 percent). In many medical schools a substantial number of teachers are nonsalaried volunteers. They thus appear in the ratios but not in the dollar amount. However, they must receive sufficient financial support through the private practice of medicine to make this voluntary effort possible.

Overall, medical school education represents only a part of the cost of educating a physician. Internship and residency constitute an equal time investment for students and may involve an even greater financial investment for society, although exact data are even more difficult to obtain than for the medical school portion of the educational program. To get some idea of the magnitude of that cost, there were last year nearly 50,000 interns and residents in American hospitals. Their average stipend was approximately $11,000 (up from $3,900 in 1965). Thus this portion of the cost for graduate education of physicians amounted to roughly $550 million. However, these house officers render important patient care which cannot legitimately be charged to education (although education is said to be the primary reason for internship and residency programs). The Institute of Medicine has estimated that 33 percent of the average 58-hour work week is spent by these trainees in improving their own skills as physicians, i.e., in their education. Essentially all of these costs are presently borne by patients (or third-party insurance carriers) since there is no tuition charge for this important phase of the physician's training.

Having completed basic and graduate study of medicine, every physician is expected to engage in a lifelong program of continued learning. It is virtually impossible to estimate the cost of this effort either to the individual practitioner or to society.

The cost of education to the individual student is quite large, even though tuition and fees amount to only 11 percent of the average medical school budget. The average tuition in a public medical school is $798 per year for residents and $1,639 for nonresidents; the comparable tuition fee in private medical schools is $2,463 annually. While these direct expenses are the only contribution students make to medical school operational costs, they represent only a small part of the total educational cost to the individual. The total annual cost is now in excess of $5,000 for single students and $7,500 for those who are married (now a majority of the student population). An even larger component of cost to a student is the lost income over a 6- to 10-year period of postbaccalaureate education. This substantial outlay of money, coupled with limited income over a prolonged period, explains why medical students end their training with an average indebtedness of between $6,000 and $8,000; more than 25 percent are faced by repayment of loans exceeding $15,000.

Although an exact accounting still eludes us, there is no question that the cost of educating a physician is high both in absolute terms and relative to other health professions. It is also evident that those who receive this education pay only a limited portion of the cost. This fact is generally justified in terms of the unique service which physicians provide, one which merits substantial training subsidy. Nevertheless, with increasing recognition of other important needs which society must support and growing questions about whether such expensive training is necessary to prepare practitioners for the health services in greatest demand, the educational practices of medical schools and teaching hospitals are being challenged with respect to cost effectiveness and cost benefit. And within universities, which are working under growing fiscal constraints, the high costs of medical schools, in relation to those of other university divisions, are being subjected to increasingly critical scrutiny by both internal and external reviewers.

In the face of these issues, the symposium panel needs to consider four questions:

- In the competition for limited public and private funds can the present costs of medical education be reduced? And if so, by what means?
- Does medical school education still deserve such substantial subsidy through Federal, State, and local tax sources?
- Should graduate medical education continue to be subsidized by patient care funds?
- Should physicians pay a greater (or lesser) part of the costs of their education?

THE PROBLEM OF COST

Stanley S. Bergen, Jr., M.D.*

Introduction

Why is the cost of medical education so high? Does it have to be so high? Could it be lower? These are questions often posed by the sources of support for our medical schools. Federal, State, and local governments want an answer, because their constituents, the taxpayers and purchasers of health services, perceive that an element in the escalating cost of health care is the high cost of medical education. Students, parents, and the public want to know the answer to why the cost is so high. It is the responsibility of medical educators to respond to these questions with clear answers and to offer guidance to ensure continuing adequate support of medical education.

The problem of cost, therefore, becomes one of identifying the elements of cost and putting these elements in perspective for our supporters. This is no easy task, and higher education administration has provided few guidelines. We must first examine the existing sources of cost information, make comparisons of those costs in various settings, and determine the elements essential to the total cost. Once this has been accomplished, we should have a better perspective as to the levels of cost and should be better able to answer the questions, Is the cost too high? If so, can it be reduced?

Both the Association of American Medical Colleges (AAMC) in 1973 and the Institute of Medicine in 1974 have attempted to deal with the problem of cost allocation. Both recognize the fact that medical education is a complex intertwining of multiple missions of instruction, research, and public service.

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*Prepared in collaboration with Meredith A. Gonyea, Director of Institutional Research, College of Medicine and Dentistry of New Jersey.

The AAMC approach comes closer to dealing with the major source of cost: faculty salaries and the activities related to that cost. Faculty members not only instruct undergraduates, but also train house officers, monitor graduate students, and contribute to nurse and allied-health education, while performing patient care and/or clinical and basic research. Crucial to the entire system is the willingness of faculty members to be involved in these activities and the costs that result from these educational products.

We must make efforts to reduce the cost of medical education to achieve a more cost-effective educational process. I believe such ends can be reached, if only by reallocation and identification of products. Part of the challenge is to identify accurately those costs that are truly educational or instructional and even within this category to clearly delineate those costs that pertain to medical students, graduate students, housestaff, and other health education professionals. Research, public service, and health care components must be separately noted and funded as a commitment of society based upon need and demand for each component. Within instructional cost centers we must be constantly aware of the need to be accountable for better utilization of our resources through joint programs, regionalization of health services, and educational efforts that improve productivity. The utilization of joint departments such as has been developed in the basic science disciplines at the University of Illinois or Michigan State University should be considered by other educational institutions.

The Elements of Cost

The Institute of Medicine (IOM) figures may be more attractive because they are lower and thus more acceptable to certain constituencies; however, the medical educator will be inclined to consider the AAMC results as more realistic. Each format represents one perception of the cost of undergraduate medical education.

In Figure 1 we examine the IOM and AAMC education costs with an adjustment for inflation. We find a range of approximately $10,000 to $30,000 per year per student with an average annual cost of $20,000. There is no question that such levels are high when compared to general university costs per student. However, one must relate this cost to the missions that a medical school is intended to fulfill.

For many years the AMA and AAMC have been providing a report on medical schools' financial support by source in their annual report on medical education.

Figure 2 presents a cost per student comparison from AAMC data (1976) delineating the total expenditures as recorded by the medical schools, based upon the total teaching responsibility of the faculty. Also presented is a cost per student analysis of educational expenditures, using the IOM-type formula. There are significant public versus private differentials and regional effects. If one compares the average cost per student per year for an undergraduate biology major of $3,000 with the annual cost per medical student, there is an obvious and marked difference. If we were to add in all the elements not presently accounted for, such as volunteer faculty and hospital costs, the difference would be even greater.

The sources of cost related to medical school expenditures are associated with the three basic missions of instruction, research, and public service. Traditionally, instruction expenditures are accounted for as the ongoing operating program, which is usually divided into four major categories: 1) faculty salaries, 2) support personnel, 3) direct expenses for supplies and equipment, and 4) indirect expenses of general administration. The largest portion of the operating program expenditures, for faculty salaries, averages 40 to 50 percent of the total.

The measure most often used as a test in this area is the student-faculty ratio. When expressed as a ratio of undergraduate medical students to full-time equivalent faculty, the number has averaged approximately 1.5 to 1 for the past 5 years. However, this value does not take into consideration other students taught by the faculty. When total teaching responsibility is considered, the ratio becomes 3.5 students to 1 faculty member. The perceptions have been that the lower the number the higher the quality, or the higher the number the greater the efficiency--unfortunately neither may be accurate.

Student-faculty measures do not speak to the question of the critical mass of faculty of various basic and clinical types necessary to provide minimal instruction regardless of number of students taught. Thus far, no one has been able to identify the critical mass and hence determine the total

Figure 1. Undergraduate Medical Education Costs.

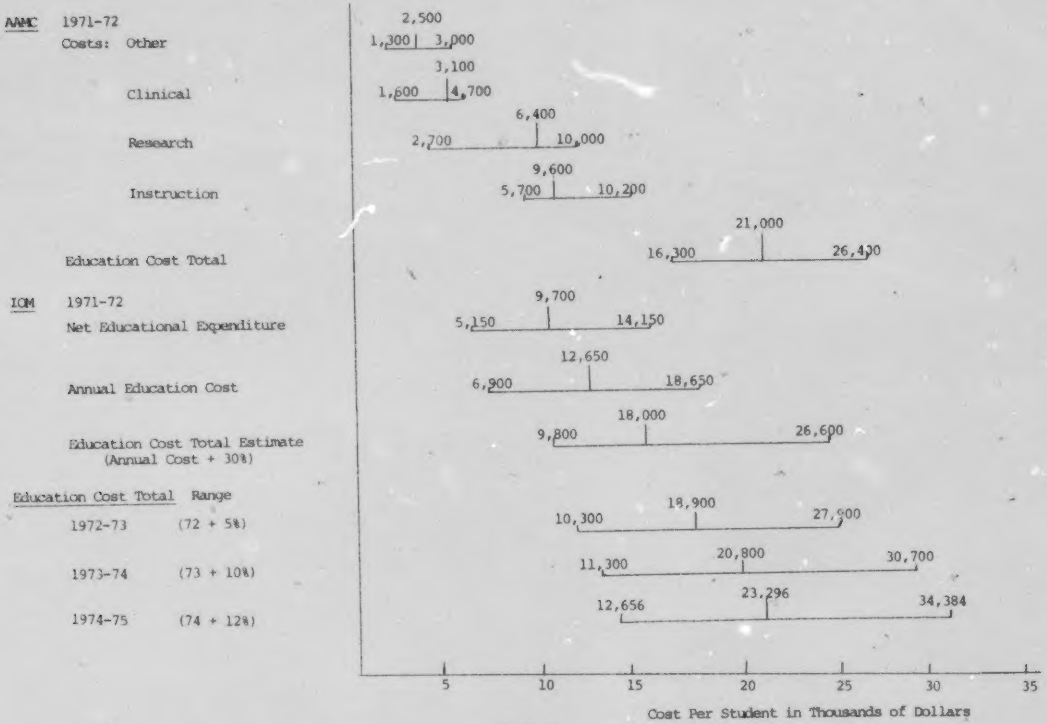


Figure 2. Medical School Financing: Cost Per Student 1974-75.

	Total Expenditure Per Total Students			Operating Expenditures Per Total Students		
	Mean	Low	High	Mean	Low	High
All Medical Schools	24,975	2,123	82,090	12,250	434	58,768
Public	24,198	9,254	82,090	13,438	5,587	58,768
Private	26,234	2,123	65,159	10,245	434	24,057
Northeast	25,292	7,380	65,159	10,053	434	21,469
South	26,500	12,129	82,090	14,261	5,587	58,768
Midwest	21,872	2,123	62,262	12,910	1,255	43,579
West	27,617	9,253	55,680	13,160	7,098	24,057
3-Year Curriculum	27,084	8,276	65,159	13,121	4,980	43,579
4-Year Curriculum	24,647	2,123	82,090	12,109	434	58,768

Source of Data: AAMC Institutional Profile System, 1976.

faculty needs of an ideal institution. Too much has been and still is left to faculty whim and power-brokering by strong departments and their demands for resources.

The research expenditures of the medical school, as well as the major Federal funding of special service grants, are designated as sponsored programs and are recorded as such in the accounts. The patient-care expenditures are often accounted for separately in the financial statements of teaching hospitals and affiliate hospitals, or, in the case of volunteer faculty, in their private-practice accounts. Factors such as ownership and cooperative arrangements between medical schools and hospitals, therefore, have great impact upon total cost. The formation of a separate corporation for the teaching hospital, State ownership, or voluntary sponsorship can obscure the real cost of such an activity compared with a single financial accounting of all costs under unit direction.

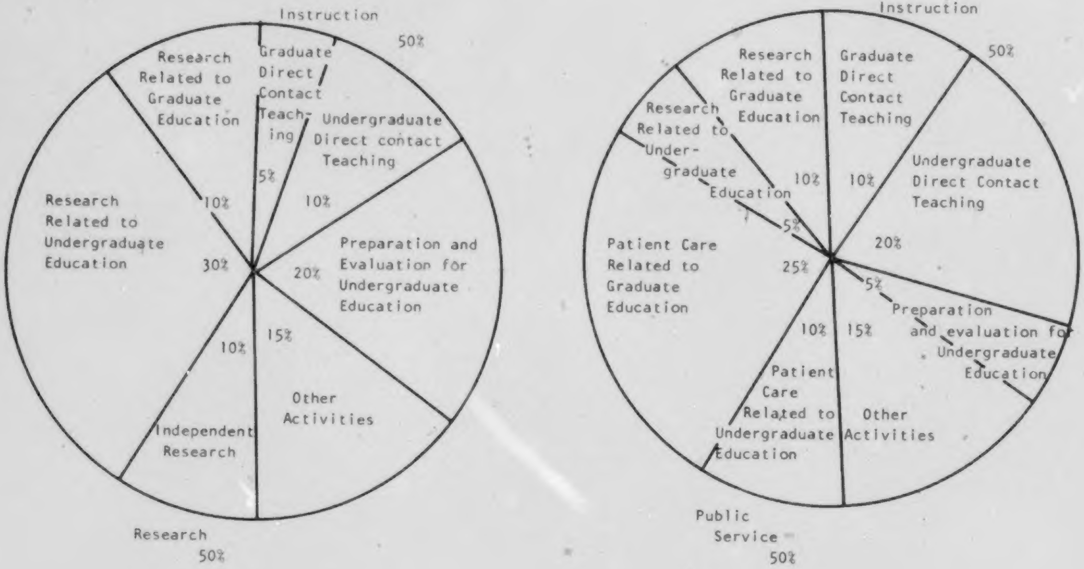
In many ways we are victims of an historical accounting system which was developed primarily to transact business in an orderly manner. We are now asking that system to provide us with cost-analysis information. The system was not designed to provide such data, and thus the problem of cost identification confronts us. The medical administrator must devise new methods for analyzing costs and their benefits so that cost centers relate to the multiple missions of a school.

Possible Control of Costs

Costs of medical education can be reduced by more effective utilization of resources, such as maximizing student enrollments within facilities, but primarily by understanding faculty activities and utilizing them efficiently. There are mechanisms by which we can reach such goals, but first we must identify the missions of a medical school and properly identify costs, responsibility for support, and acceptance of that responsibility as a commitment of society.

Table 3 presents a constructed cost view, prepared from IOM and AAMC data of the range of activities of full-time faculty members engaged in education at a multimission institution. Note that to obtain a value for direct-contact teaching time for undergraduate medical students, full-time faculty activities such as graduate instruction, preparation time, research, patient care, professional development, and so forth must be allocated and supported. When a school employs part-time faculty, usually it pays for direct-contact teaching alone. Although the other activities are considered necessary, they

Table 3. Distribution of Activities for Full-time Faculty in a Multimission Institution.



BASIC SCIENCE FACULTY MEMBER

CLINICAL SCIENCE FACULTY MEMBER

are not represented as direct liabilities of the school's teaching program. Determining the proper mix of full-time and part-time faculty to support the defined missions of an institution are critical decisions that affect cost. It then becomes a question for a larger group such as society to decide the full costs and benefits of medical education and to balance these costs against other priorities.

One way to approach the problem is to use the existing data for general comparison purposes. For example, the average medical school expenditure per student is approximately $25,000 per year. If a school is spending far less in one category, it may well have decided to defer a major objective because of insufficient funds. Contrary to popular beliefs, the relatively small numbers of students in health professions programs do not lend themselves to economies of scale. This means that the least costly programs are not necessarily the most efficient.

Missions Related to Cost

Once one has determined a reasonable cost for medical school expenditures, it must be ascertained that this represents the full cost of the total program. To deal with this question, medical educators must describe more precisely the multiple missions of health science centers and their interactions with their community environments. Duplication must be avoided where possible. The age of "me, too," must be put behind us if alternate methods of providing the services or the educational experience can be obtained from other sources. Once this is accomplished, apportionment of expenditures from multiple accounting sources can be made. At the present time we have bits and pieces but no real picture of the whole. A note of caution: When one performs this kind of analysis, one must be prepared to justify missions of instruction, research, and public service on their merits alone, rather than hiding them under the blanket of education. We must all be aware that there is potentially high risk involved in such definition of missions and costs.

Responsibility for Support

Who should pay? Table 4 displays a percent total support analysis by source within the program type for all medical schools, divided as to public or private, for the fiscal year 1975, as recorded in medical schools' accounts. The table shows that: 1) Federal funds support more than 40

Table 4. Medical School Source of Support By Type of Program As Percent of Total Support.

	All Medical Schools		Public Schools		Private Schools	
	1970-71	1974-75	1970-71	1974-75	1970-71	1974-75
I. Sponsored Programs						
A. Teaching and Training Grants	13.0	12.3	12.9	12.2	13.0	12.4
B. Research	28.1	25.6	22.4	21.6	32.8	30.1
C. Other	13.4	12.6	9.4	10.5	17.1	14.9
Sponsored Total	54.5	50.4	44.7	44.3	62.9	57.4
II. Operating Programs						
A. Tuition and Fees	3.7	4.3	2.1	2.4	5.1	6.5
B. Indirect Recovery	5.9	6.5	4.3	4.7	6.6	8.5
C. Unrestricted Revenue	3.3	1.6	1.0	0.2	5.4	3.3
D. Professional Fees	10.1	10.1	13.2	10.2	9.1	10.0
E. Miscellaneous	3.6	5.8	3.0	4.1	4.1	7.7
F. State Appropriations	15.3	17.8	30.1	33.5	1.2	0.0
G. State, Local Subsidies	1.3	2.5	0.1	0.1	2.4	5.1
H. Reserves	2.3	-	1.5	-	2.3	-
Operating Total	45.5	49.6	55.3	55.7	37.1	42.6
Federal Funds	45.5	39.7	40.3	35.9	49.6	44.4

Source of Data: AAMC Institutional Profile System 1976.

percent of total expenditures for all medical schools. 2) State appropriations support more than 30 percent of total expenditures in public schools. 3) Tuition and fees support less than 10 percent of expenditures in public and private schools.

Table 5 presents data on the sources of support for university-owned teaching hospitals where major house officer education and patient care activity expenditures are recorded (Journal of Medical Education 1976).

Hospitals with State funding receive appropriations representing more than 20 percent of their total income. Third-party payers and the Federal Government are the other major contributors. In nonstage-funded university teaching hospitals, third-party payers and the Federal Government provide the primary support.

A review of the data presented in Tables 4 and 5 indicates the following:

- The principal contributors to the instructional mission operating budgets of medical schools are State governments, private philanthropy, the Federal Government, and students.
- The principal contributor to research and sponsored public service missions is the Federal Government.
- The principal contributors to the patient care mission recorded in teaching hospitals are the State governments and third-party payers.

The responsibility for supporting the cost of medical education in the past has been shared by several parties. It appears that decreases in support of one mission are the result of increases in support of another mission, or may require such an increase to assure solvency. If any one supporter is eliminated, its share must be assumed by the others. Shared responsibility appears to be an accepted principle.

A major problem with the shared responsibility concept as it now exists is that each supporter perceives itself as dealing primarily with one mission of medical education while

Table 5. University-Owned Teaching Hospitals' Source of Support.

	Percent of Total Support			
	Hospitals With State Funding		Hospitals Without State Funding	
Source	FY '72	FY '74	FY '72	FY '74
State Appropriation	26.0	21.2	0.0	0.0
Blue Cross	15.3	14.1	27.7	26.4
Commercial Insurance	15.6	13.8	19.3	15.1
Self Pay	8.1	11.3	9.6	12.7
Medicaid	12.4	12.8	13.2	12.9
Medicare	12.1	16.5	20.3	23.9
County Appropriation	1.9	1.5	--	.2
City Appropriation	.1	--	.1	.1
Additional Welfare Payments	1.2	1.7	.8	.9
Other	7.3	7.1	9.0	7.8
Total	100.0	100.0	100.0	100.0

Source of Data: AAMC Datagram, Journal of Medical Education July 1976.

in fact it is supporting portions of multiple missions. Therefore, individual perceptions are limited to the segment with which each is dealing. This causes an emphasis to be placed on parts of the cost, rather than attention directed toward an economy of the whole. Several points seem evident. First, the cost of medical education is high and will continue to be high even in its most cost-effective state. Second, the benefits derived from the multiple missions of medical education when explicitly identified at least balance the costs if not outweigh them. Third, when in proper cost-benefit balance, the full cost of education deserves support. Last, the responsibility for supporting the cost of medical education should be shared by the beneficiaries in direct proportion to the benefits accrued.

Society must decide how much research and service it wishes to obtain from our medical schools and openly accept and support these efforts.

These are long-term goals; however, I should like to suggest some immediate steps which medical educators should be taking within each institution. We must: 1) examine all sources of funding, with proper accounting of these sources and identification of what is the intended purchase and product; 2) identify clearly the multiple missions of a medical school with specific allocation of all costs to cost centers such as undergraduate, graduate, and housestaff education, patient care, research and so on; and 3) seek societal concurrence and national commitment to identify clearly and to accept these missions so as not to include such other elements as the annual per-student educational cost. Each supporter must be able to identify products and missions fulfilled.

With the need for greater accountability, and with the great interest in and criticism of the cost of health care and medical education, it is incumbent upon all medical administrators to assure the public that each element is defined specifically so that supporters can identify their contributions, what they purchase, what products are obtained, and what missions are fulfilled.

Medical schools and other institutions involved in the education of health professionals must be subsidized by public funds as a commitment of society to support this national resource. Unfortunately, I believe that the future will bring diminishing Federal support now that the goal of increasing the number of available physicians apparently has been fulfilled by the financial stimulus. We must balance the contribution of public dollars against the concept of governmental control and mandatory service, if our future physicians expect continued freedom of choice and flexibility with respect to location, specialty, and type of practice. Future subsidies probably will be tied to service and other restrictions and/or requirements despite the Carnegie Commission's (1976) call for "a stable base" to be provided to the schools. While one can argue indefinitely the philosophical aspects of such a choice, the only available options to public subsidies are the following:

- Greater private contributions--a difficult pursuit in today's environment.
- Greater economies, which, while possible, are limited.
- Sizable contributions from clinical faculty practice.
- Greater student or patient contribution.

The patient, much like the public sources, has become increasingly resistant to the support of medical education as a cost of health care. In many cases we are considering the same public dollars that provide capitation grants. This competition for a share of Federal health care resources will intensify. With the current attacks on health care costs, suggested limits for medicaid and medicare reimbursement, hospital rate review, and certificate of need programs, I fear that a vulnerable area may be the component of the per diem rate allocated to medical education. The insurance companies, union welfare funds, and employee benefit plans, themselves under pressure for economies, will look to this area as a possible point of cost reduction. A broader base from either State tax dollars or increased tuitions seems to be the only available alternate source of support.

While I believe most would agree that a medical school education has been a bargain for many years, there are those who advocate completely free medical education. Such an educational system would be accompanied by the correlate of long-term obligations to the State. The issue of increased tuition payments is a complex problem which includes such variables as: 1) student commitment, 2) supply and demand, 3) future earnings potential, 4) free enterprise, and 5) the right of the purchaser to have a greater voice in determining the product.

Physicians do earn great economic rewards but, as Dr. Reinhardt (1976) has recently observed, so do many others; and this income occurs at the other end of one's career. Dr. Reinhardt notes that physicians' income represents only 12 percent of the total of all health care costs and, based on 1975 costs, a 25 percent reduction in these salaries would decrease expenditures by only 2.7 percent or less than 0.2 percent of the GNP (gross national product). Many students carry great economic burdens, having incurred significant debts from undergraduate education. Each year of medical school becomes more costly for basic maintenance, and the total cost burden, including tuition, carried by the student will increase in the future. These high costs need to be carefully balanced against what the student and family can reasonably pay. Moreover, countermeasures should be taken to avoid the adverse effects upon total health care costs of graduating into practice large groups of practitioners who are encumbered by debts so sizable that they feel obligated to liquidate them quickly by high fees and earnings. In addition, we must be cognizant of the service payback programs and long-term debt amortization.

In summary, I believe that the previously favored position enjoyed by medical and health profession schools in commanding a large share of public and private resources will diminish. State governments will, in turn, experience greater demands to replace Federal subsidies and will expect accountability by graduates to respond to local and regional needs. There will be increased scrutiny of the allocation of health care service dollars to education and in part these reduced funding sources will be replaced by increased contributions from students and greater identification of cost-centered funding for research, patient care, and other activities of a school and its faculty. We must continue to emphasize to Federal, State, local, and private philanthropic officials the need to fund adequately all these functions as national and regional resources. The loss of adequate funding for even a brief period could have a destructive impact upon the health and physical well-being of our Nation and society in general.

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THE PROBLEM OF COST

Roger J. Bulger, M.D.

We were asked to answer four questions which can be summarized briefly as follows: 1) Can medical education costs be reduced? 2) Should there be continued Government subsidy at current levels? 3) Should postgraduate years be subsidized by care dollars? 4) Should M.D.'s pay more of their education?

But a fifth question should be added: How difficult or easy will it be to make wholesale changes in the current situation?

For my part, I find these questions to be second order questions, the answers to which are to be founded upon more basic and fundamental considerations. Realizing that such a comment may indicate that I have no intention of answering the four questions directly, let me do so at the outset by indicating that for the time being, my answers are: yes; yes; ideally, no; and yes. Having said that much, let me proceed to what may be the more fundamental concerns.

The first observation I might make is that these questions are now really public policy questions, matters which involve the public generally and which are no longer strictly within the parochial purview of professional educators, scientists, or students--and it is noteworthy that no one representing the latter perspective is on our panel.

Each question essentially concerns values to which there is no immutable, obvious, or completely rational or correct response. In each case, today's right answer may become tomorrow's mistake, since any answer to any of these questions is interlocked with prevailing societal views of health, disease, doctors, and the various health care establishments.

Such matters as the following have a strong impact on societal answers to our four questions:

- How much do we value health?

- How much is high technology in health to be esteemed? How much will we continue to invest in artificial parts and dramatic individual interventions compared to preventive measures and mass behavioral approaches to changing habits that impact health? How effective will these mass behavioral efforts prove to be? How successful will we be at controlling health care costs? Of what nature will be the public's general attitude toward science and technology? How successful will physicians be at sustaining their profession's identity, integrity, and high public image? How soon, if at all, will physicians' exalted economic standing contribute to their decline from the premier place in society? How successful will the profession of medicine be at developing an identity with health promotion as distinct from a singular focus on disease? How much of the blame for the spiralling health costs will the public place on doctors?

In essence, I believe that society at some point will say, 8 percent of our GNP is the limit to spend on health care--or 9 percent--or 10 percent--or 12 percent--or it is only worth 6 percent! Moreover, when and where that boundary is set will surely affect how much society will pay for the education of its most visible health professionals.

In addition to the value society places upon medicine, medical science, its existing practitioners, and the effectiveness and efficiency of current health care, other fundamental societal concerns will impact on our four questions, such as our national drive to equality of opportunity. We must ask whether medical education shall be open to all deserving citizens regardless of their ability to pay; whether America still holds firmly to the idea of a university that includes the institution as a storehouse of knowledge and talent and information for the benefit of ourselves as well as our progeny (and I fear for the maintenance of this latter aspect particularly!); whether society wants the State to control all such endeavors, or whether it wants the State to be able to exert a moderating or influential force rather than holding total control; and we must ask how strong our national stance shall remain vis-à-vis the desirability of diversity and heterogeneity. Individuality may be sloppy and in some ways inefficient and uneconomical, but we tend to believe that it is generally more desirable than one central and nationally uniform way of doing things.

If our Federal Government gets too powerful a hold on the medical educational budget, let no one doubt that its operatives will use that hold to make any and all kinds of substantive changes they think desirable in the educational process. We should be wary of that and we should, I believe, maintain a healthy respect for diversity. As with research, we do not want one small group of judges to choose the targets and decide how all of us will attempt to hit them. Let me turn again to the specific questions posed to our panel and further develop my own answers.

Of course, educational costs can be reduced, but one hastens to add that in some institutions the costs probably should be increased to better provide the elements of an adequate education. First, education costs ought to be defined and agreement reached as to a single method for measuring these costs in all medical schools. I had thought that a uniform cost accounting system would be the most important single outcome of the IOM study and I still believe that medical education generally would be better off if the educational establishment could come to a concensus with the concerned public and governmental constituencies on an appropriate cost-finding methodology. I suspect such an attempt would meet with resistance because many institutions may be afraid of what the impact might be of agreeing to any one such method.

As most medical educators know, many educational activities are also associated with other activities and/or other products; thus one can either increase or decrease the imputed cost of education by assigning more or less of the joint product costs to research or care or service than to teaching. It seems clear that in some institutions, education dollars are supporting research, while in others research is supporting education.

Obviously, the simplest way to cut costs in a labor intensive activity is to cut personnel. Indeed, the IOM study showed that the major difference between high and low cost medical schools was in the faculty to student ratio. It is my own belief that the multiple outputs of medical schools (graduate students, residents, research, and so on), taken in the aggregate, do justify society's investment. The challenge for the future lies in justifying the educational dollar per se. For me, this means separating out with accuracy and consistency those costs attributable to undergraduate education and making those dollars as cost-effective as possible in meeting each institution's educational objectives.

As for whether there should be continued subsidy at current levels by local, State, and Federal Governments, my answer is "yes," but that subsidy must never become so large or dominant as to become controlling. Public and private institutions should stand and flourish. The different missions appropriate to some private schools as compared with public institutions should be carefully respected and cherished. In our zeal to be responsive to public concerns and relevant to societal needs, it is crucial that we value the independent search for creativity, excellence, and quality that is especially identified with America's great private universities. For me, the essence of the interface between public and private in a private medical college is a delicate balance between some public influence and ultimate private control.

Obviously, State and local investment in medical education is a complex subject, even if one decided to focus on one locale or one State, much less the whole country. Because of this complexity, I will not attempt to explore this subject, except to say that it would seem unlikely that funding from such sources will increase, at least when considered collectively.

Should the postgraduate years be subsidized by patient care funds? My answer to this question is "no," assuming alternatives are found. This is a big assumption because "education" dollars are even more scarce than "care" dollars, and I presume this circumstance is the basis of AAMC's resistance to changing the current funding pattern. There is an equity question as to whether it is more appropriate for users to pay for the education of providers when they pay for services, or whether those educational costs should be met by contributions from patients and all potential patients--that is, through the tax system.

On the one hand, one could develop a logical and compelling argument for Federal support and subsequent control of postgraduate training, because then a central planning mode could work coherently at meeting manpower needs. Alternatively, since there is a greater correlation between place of residency training and location of practice than there is with medical school locus, the argument has been advanced that State Governments ought to provide educational funding. This is already being done in many States with mandatory family practice residency programs.

My own preference is for the latter approach, because it links the subsidy more closely to regional needs. It can be used as an additional lever to tie residencies to the academic health center. Here again a uniform cost-finding method must be adopted to impute the proportion of residents' stipends which is an educational expense and should not, therefore, be charged to health care. A third option would be to ask the individual resident to bear the educational cost, working through a modified "Yale plan" of deferred repayment of a Federal or Office of Economic Opportunity bank loan.

The answer to whether M.D.'s should pay more for their own education is affected by future control on physician income and/or tax reform. These possible changes notwithstanding, I find most appealing the potential benefits of a modified Yale plan for medical students, in which a proportion of annual income is donated to the school by the individual rather than via the Government.

Although I wish it were possible to wait and see how the current generation of students handles their fees and incomes, I cannot see society being able to tolerate much longer the combination of fantastic physician incomes and equally fantastic educational costs which the public is being asked to support in ever-increasing fashion. On balance I find most compelling the arguments for at least some subsidy via the student to the institution, even though this may do violence to the time-honored goal of public education to keep tuitions low. If the subsidy comes via individual students, they will become collectively a more important constituency in program determination; and I think that is a far healthier situation than to give that influence to the Government.

George Wright's article (1974) on financing medical education is useful especially in that it demonstrates how difficult it is to find perfect solutions to these problems. In my own view all four of these questions have answers which are interrelated. I do not believe we now know enough to make the most intelligent choices and suspect that more careful and detailed analyses of various options would be useful and enlightening. No matter how careful are our logical analyses from first premises to last, change when it comes is likely to be political, piecemeal, and incremental in nature. We arrived at this point by using whatever resources were available to get the job done, and logical attempts at wholesale restructuring of the entire system in a more coherent way are likely to do more harm than good--unless the effort is exceedingly well planned.

In summary, I believe most institutions must move to cut educational costs or at least prevent them from rising; Government subsidy should be sustained although at least some of these dollars might flow to the medical school through loans to individual students; and medical care dollars should not support resident education if adequate alternate funding can be found.

Lastly, it seems inevitable that M.D.'s will be under considerable pressure to assume more of the burden for their own educations, both at the undergraduate and postgraduate levels.

The need to make some progress on at least some of these items is the result of the gradual but inexorable coming together in the public mind of the following: high cost of largely Government subsidized medical education, the financial status of physicians, the belief that physicians create their own demand and in part generate escalating health care costs, the developing theme being trumpeted by a few loud voices that the medical model creates more problems than it solves, and the determination of clearcut physician shortage areas that seem to defy correction short of a mandatory placement via something like the National Health Service Corps. If the profession continues to fight off all initiatives that address these issues, I fear the public may suddenly withdraw its trust, turn on the profession, and substitute by governmental fiat highly disconcerting and perhaps destructive major new initiatives.

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THE PROBLEM OF COST

Mark Splaingard, B.A.

Today's American medical establishment is grappling with a wide spectrum of issues, ranging from the definition of death and euthanasia to the rising cost of health care. In particular, utilization of resources has recently become a topic of scrutiny. Whether it concerns kidneys or dollars, questions of utilization have evoked responses, often conspicuous by their lack of substance from medical, legal, and governmental institutions of this country. Included in this controversy of cost utilization is the funding of medical education, namely, who should finance it and under what conditions.

The purpose of this paper is to present some critical financial issues, explore in detail a few of the major points, and offer suggestions to possible solutions.

The first question is: What costs are we dealing with in discussing medical education? From a fiscal viewpoint, a recent analysis (Challoner 1974) estimates the cost of an undergraduate medical education as falling between $16,000 and $20,000 per person per year. This is in comparison to a cost of $6,711 for the education of a graduate student (Jussin and Mueller 1975). It is estimated that State and local funds supported 18 percent of this cost in 1971, a sharp decline from the 34 percent share in 1947. Support from Federal funding has increased, however, from 20 percent in 1947 to 45 percent in 1971, with a high of 55 percent in 1968. The remainder of the cost is met, for the most part, by medical services income, with private sector contributions comprising only 3 percent of total support in 1971. Student contributions, almost 17 percent in 1947, now average only 4 percent of the total educational cost. There are inherent difficulties in studies of medical education expenses, arising from 1) the somewhat arbitrary evaluation of faculty allotment time to educational duties,

2) the amount of research "basic" to medical education, and 3) the hospital resources necessary for students. Yet, regardless of small variations in analytical techniques, the point is made that medical education is extremely expensive.

A recent study (Journal of Medical Education 1975) breaking down components of medical school budgets is of particular interest in that it reveals the wide variety of expenditures and, ultimately, total costs from institution to institution. Table 1, for example, shows the extremes between two types of institutions.

TABLE 1. Comparison of Two Sets of Medical School Budgets.

Budgets in Thousand Dollars

Institutions	Total Cost	Institutional Expenses	Research	Clinical	Other
A	26.4	9.6	10.0	3.8	3.0
B	16.4	6.4	3.7	3.5	2.8

In spite of the limited scope of analysis for the study (only eight schools were examined), with the exclusion of minor regional cost differentials, the results show that a large portion of medical education expenditures involve support of research. Research expenses range widely among institutions studied, from a high of 38 percent in the most expensive institutions to a low of 22.5 percent in the least expensive institutions. Interestingly, while the absolute figures vary, the proportion of expenses alloted to instruction differ only slightly between institutions, that is, 36 percent in the most expensive institutions versus 39 percent in those least expensive. While admittedly close coordination of teaching and patient care responsibilities is essential for student training, thus making difficult the separation of education costs from those of patient care, it is clear that institutional differences in total educational expenses reflect in large degree differences in research expenditures between schools.

In short, medical education today involves large capital investments, mainly government borne, and has a large basic research component included in its cost. The 1976 medical student is subsidized to a greater degree than his or her 1947 counterpart, who paid then only a fraction of the real cost of education. These points are not generally appreciated by many, including students themselves.

The previous discussion concerning the cost analysis of medical school expenses is essentially quantitative and, to a certain degree, objective. The subsequent sections, containing views supportive or critical of the present financial structure, are not quantitative since they deal with value judgments and certain inherent biases. I shall now turn to the issues of controversy and summarize the major arguments of each position. This style is adopted in hope of presenting to the reader not only the issues themselves, but also a cross section of the divergent views.

The key issue of who should pay for medical education stems from the age old controversy concerning who benefits most from education, society or the individual. Many proponents of the present system whereby Government supports a large share of medical education take the position that medical education provides an essential service to society by providing a steady supply of physicians, thus increasing the overall standard of living within the general society. The learning of medicine then satisfies a desired social objective, and should be subsidized by society. Subsidies are made to education in general, it is argued, and it is ridiculous not to finance the final steps in the process of producing health professionals, be they physicians, dentists, nurses, veterinarians, or men and women in allied fields. If it wants doctors, society should encourage adequate training through adequate funding, according to this view. It is further pointed out (Science 1974) that one-fifth of the total physician population in the United States is now comprised of foreign medical graduates, who are trained at no expense to U.S. taxpayers, and who would comprise the graduating classes of 40 average-size U.S. schools. Americans are actually undersupporting their medical personnel, and more Government subsidization of schools and students should be occurring. It is maintained that the U.S. should stop siphoning the medical trainees from other nations, hence augmenting these countries own shortages and taking away from them responsibility for financing their own health care systems.

Contrary to this, the position taken by many critics of present medical education financing is that medical education, like other forms of higher education, more directly benefits the recipients of the education than those in other fields. It is argued that physicians are among the highest paid members of society, with an average annual salary of approximately $45,000 and lifetime earnings in the neighborhood of $1½ million. Government should not be supporting the education of people who, upon graduation, will reap huge financial windfalls without obligation. It is maintained that students should be held responsible for 100 percent of their educational expenses and be forced to deal with either private institutions or Government for funds to finance their training.

Thus, two views based on different philosophical attitudes can be presented. Which argument on this particular issue is more acceptable, more justifiable, or more correct? One is forced to decide. Yet, this decision may seem black and white compared to the second controversy related to the financial issue, namely, personal freedom of the students involved.

Critics of the present system argue that Government funding in the past has placed no obligation on students or schools except that the money be used for educational purposes. This has led to expansion of facilities and production of more M.D.'s but has not alleviated health problems in many areas because of a maldistribution of physicians. Impressive statistics point out that physician population ratios are much lower in inner city and rural areas than in white suburban areas. Thus, despite their tax dollars supporting medical education, certain areas get short changed. A solution to this inequity, according to proponents of this argument, would be to place stipulations on students and schools in accepting Government funds. Alleviating maldistribution and, hence, improving general health could be accomplished by charging students full tuition for their education and allowing them to borrow money from the Government in exchange for a yet unspecified number of years of service in a specific Government-assigned area, in this case, one having a shortage of physicians. To ensure success of this "service-subsidy" program, it is further proposed that Government funds should be used to support schools and students only if a certain percentage (probably 25 percent) of either the students of the entering class or the entire student population were to accept Government service-subsidy funds. This measure would assure the availability of enough physicians to solve the maldistribution problem in health care quality.

Opponents of the idea of mandatory service-subsidy funding--those in favor of no restrictions on subsidies--argue from a variety of positions. Some people feel that charging full tuition, with only Government service financing as a reasonable method of students meeting tuition costs, would result in a schism in the student population. Wealthy students would be able to afford educational costs no matter how high, and they could enter the lucrative specialties and subspecialties, while poorer students would be forced to accept Government service as a prerequisite to entering medicine, thus spending years in possibly unwanted primary care positions in unattractive areas to finance their education. In this manner, it is felt, inequality of health care in society would be converted to inequality of student opportunity based, not on ability, but on wealth. In effect, poor students would be forced into accepting a physician draft to get their medical degrees.

The alternative, in line with this viewpoint, of a student borrowing money from a private source at 10 or 12 percent interest virtually precludes any student upon completion of his or her education from moving to a poorer area. Even if the desire to do so exists, the medical school graduate is confronted by practical concerns. The amount of debt amassed may dictate a move to an area where assurance of as much reimbursement as possible is guaranteed to more quickly diminish educational debts.

Other arguments have been constructed against service stipends. One can argue that all education is subsidized to some extent and a dangerous precedent is set by allowing Government, through its support of education, to dictate (based on future guarantees of service to the Government) the terms of who should be admitted to a given profession, in this case, that a percentage of the student population must accept Federal service-subsidy grants. Allowing Government to control acceptance into a profession based upon its determination of the need for a given skill is contrary to our social and legal heritage. It is maintained that the issue is whether Government should be allowed a hand in selecting applicants to a profession based, not merely on sex or race, but on willingness to serve the Government as well. It can be argued that with the highly competitive nature of today's medical school admissions process, it is likely that all but the most gifted students, in spite of financial position, would accept the Government's terms for subsidy. By accepting the subsidy, he or she might better increase the chance of acceptance into medical school, given the requirement that 25 percent of the class must be composed of people with Government subsidies. This practice would place even wealthy students, able to pay all costs, in the position of accepting Government service as a condition of gaining entrance into medical school.

Finally, critics of service subsidies contend that the most common argument for instituting this plan, namely maldistribution, is itself specious. As yet no author, governmental or otherwise, has been able to state what the optimal physician/population ratio is or even, more specifically, at what point increasing the physician/patient ratio would improve health care. The inability of the Government to concretely define what is meant by quality health care and, even more important, to determine the cost of such care to the taxpayers weakens Government's claim of the necessity of regulating education for the reasons of improving maldistribution and health care. What is being improved and to what end is the question these critics want answered. Since there is general agreement that environmental effects play a more important role in improving public health than physicians, has Government's record in such areas as public housing and pollution control, to name a few, been so outstanding as to warrant its entering another field, namely, medical education? A common view of Government officials is summed up by the following letter to the New England Journal of Medicine (1974): "They can't win a war, manage an energy crisis, control inflation or even run an honest house . . . incompetent meddling further compounds problems as happens with everything big Government gets involved in."

Thus, I have presented the major points in the present controversy over medical funding. It is obvious that I feel the only realistic means of financing medical education is either from public resources or from the individual student. The private sector, once responsible for 10 percent of medical budgets, presently contributes only approximately 3 percent of them. While this might be slightly increased, I fail to see private contributions as anything more than token support, simply by nature of the amounts of money involved. After constructing the various arguments, I was led to further scrutinize the issues at hand. Two points need to be expanded.

First, concerning physicians' earnings and the fact that only 4 percent of medical costs are paid by students, talks with tax experts reveal some interesting points germane to the discussion. The average physician earns approximately $45,000 a year. Estimating the annual income of a college graduate to be approximately $20,000, it can be calculated that the college graduate will pay approximately $2,500 in annual taxes compared to the annual average of $8,000 paid by the physician. The estimates assume itemizing of deductions for both, similar family situations, and housing values of approximately double the yearly salary (an accounting standard). One observation is that in less than 20 years, the average physician has repaid the Government the full cost of even the most expensive medical education. Thus, physicians are in effect good investments for Government on purely financial grounds since in another 10 years (or, in a total of 30 years) taxes will be collected from the physician at a higher rate than that for the taxes of a college graduate (approximately $55,000 in total). There is yet another observation, that some individuals will earn and pay in taxes large amounts of money without educational subsidization of any kind, for example, rock stars and athletes. Yet, on a statistical basis, educational level is still a solid indication of income and tax levels. Thus, physicians, through the taxes they pay later in their careers, reimburse the Government for any subsidized education, at least for that obtained in public schools.

A second point concerns the issues of subsidization service grants. Personal conversations with lawyers have convinced me that according to present laws, students can default on Government loans at graduation and can only be held legally responsible for reimbursing the Government of the face value of the loans and the accrued interest. This allows the possibility (no doubt already arrived at by some) of students, especially wealthier ones, taking Government funds as an edge for gaining medical school admission and later refusing service at some convenient time, preferring to pay back funds rather than to fulfill service obligations. This behavior would obviously defeat the purpose of the entire program, and maldistribution would continue despite Government action. Two possibilities exist; one is that laws could be changed, with heavier penalties to those who default. This action, I am advised, would be subject to lengthy, expensive court challenges which might ultimately fail to uphold such a law. The other possibility is that the alleviation of maldistribution, Government's main concern, might be better approached through admissions committees and new types of medical schools such as the Rockford and the Peoria Schools of Medicine in the University of Illinois system. These share an emphasis on selecting the type of student whose background lends itself to smaller community living and on providing the type of education that allows exposure to rural populations and their medical problems. Which alternative will ultimately be chosen depends to a large extent on the success of programs like these.

After weighing the previous arguments, I have become convinced that funding for medical education is a responsibility of government at all levels and the individual student. A reasonable compromise, I have concluded, would be for students to pay what I have termed the "instructional cost" of their education, that is, $6,000 to $9,000 per year or 36 to 39 percent of their total educational cost. Government at all levels, but mainly Federal, would assume responsibility for the remainder of the medical school budget, or 61 to 64 percent of the total cost. This proposal, although arbitrary, has a concrete basis: Students would be financing only the instructional cost of their education, which is the area most directly affecting them, whereas Government would assume responsibility for research expenditures, which are used directly to benefit society as a whole, and hospital costs, which have a large patient benefit component.

In addition, the problem of students financing this $6,000 to $9,000 per year in tuition fees could be solved by institution of an income-contingent loan fund of the type described by Friedman and Kuzents in 1945 and applied to medical financing by Strauss in 1970. This plan works like "insurance in reverse" in that the student receives educational funds or "benefits" during the school years to pay for education and, in turn, promises to pay the "premiums" covering the amount loaned plus interest when he or she begins earning fair wages. There are numerous variations to this basic plan, mainly concerned with methods of repayment, but suffice it to say that whether a fixed percentage of income or block payments are used in repayment of the debt, the program allows students to pay the cost of their education based on their future earning potential. The main problem in instituting such a program is that a large amount of capital is necessary to finance the initial portion of the program before it becomes self-sustaining. Federal Government, with the money it saves from discontinuing direct capitation payments for student education, would be an ideal candidate for initiating such a program, since virtually no support of it would be required.

This proposed program has certain appeal since students ultimately would be financing a greater portion of their educational expenses, and Government funds would be released after a few years for use in other areas. Yet, this process would occur in such a way as to allow the student flexibility in his or her ultimate goals and does not dictate that he or she rush headlong into moneymaking to repay loans quickly. Government, on the other hand, slowly decreases its total support of education and initiates a self-supporting income contingent loan plan at the same time.

The advantages of this plan over direct capitation is that the Government gradually reduces its share of health education costs, and hence might channel these resources into other health areas that need financial support. The advantages of this plan over direct student payments that cover total education costs is that students would be held responsible for support of research and hospital costs, which are of more general benefit to society than are instructional costs, which relate directly to the student.

The goals of any funding program for medical education must not only be adequate in terms of financing, but also with regard to consistency, in the sense that programs be allowed to develop and grow unhindered by lack of resources. Students in schools have a right to demand fair treatment in funding of their educational programs; the public has a right to see that its money is spent in its best interest. By involving both elements in the funding of medical education, it is hoped that the physicians of the future will be responsive to society's needs, and society, in turn, will be conscious of the demands of the medical profession. Just as the issues are complex, so are the resolutions, necessitating a coordinated effort between Government, the medical community, and the physicians of the future in providing the medical education and a health care system for the future.

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THE PROBLEM OF COST

John E. Corbally, Ph.D.

The overall title of this bicentennial symposium provides one subject for discussion which has not been covered fully by the panel sessions up to this point. The term, "contemporary world," has a certain conciseness and implied clarity which lulls one into believing that we do understand what the contemporary world is. The term is a generalization which will be analyzed and perhaps even synthesized this afternoon under the heading "One World or Many...," but even that discussion may dismiss lightly the meaning of "contemporary." As I attempt to consider the costs of medical education, I am struck by the need to consider "why," "where," and "when," as well as the more common terms "to whom" and "how much." In these days of "accountability" and of "cost-benefit" analysis, it is not enough to project averages of national cost data per some unit for any activity in order to arrive at estimates of average costs at some future date for that activity. If I restrict my vision of the world to Illinois, it is clear that the costs of medical education conducted in Effingham may differ from those conducted in Chicago or in Urbana-Champaign. It is also clear that the costs to produce a specialist member of a medical factory are different than are the costs of producing a Marcus Welby--if, indeed, either is what we want to produce. Furthermore, one needs to consider the contemporary or future makeup of the medical team: What kind and what quantity of medical practitioners are funds to be spent to produce? If technology increases the capability of computers and other related technical apparatus to assist in the practice of medicine, will we increasingly consider the preparation of medical programmers, of medical equipment service personnel, and of medical equipment operators to be part of the cost of medical education? What portion of the cost of technological hardware is to be a part of the cost of medical education?

Another important question relates to the roles of various groups and individuals in defining the products of medical education for which "production costs" are to be increased. In the broader context of the support of higher education, I have wondered aloud about the possibility that we are having support problems because we are providing services which we, as professionals, believe the people should want while the people themselves neither want those services nor want to pay for them. Could it be that in our professional zeal to prepare the perfect contemporary medical practitioner, our definition of "perfect" contains more components and requires more dollars than may be required by the people's definition of "perfect." While I decry what I consider to be the new mantle of expertise granted to those with least expertise under the guise of "consumerism," and do not want as a patient to define how a physician should learn what he needs to know or even what he needs to know, I do have some views about what I want and do not want from my physician. I imagine that my views will not be the same as those held by a group of physicians and medical educators, and there may well be some cost variations depending upon which view one adopts. If you describe to me what the cost will be to prepare what your view says I need and if I fail to agree that I need what you say I need, I am likely to prefer saying "no new taxes" to approving your costs.

What I hope I have made clear is that before I am prepared to discuss who should pay how much in support of medical education, I must ask some basic questions about the practice or delivery of medicine and about the meaning of the term "medical education." I am unwilling to assume that what we are doing is fine and that the calculation of future costs is a simple process of computation involving inflation estimates and numbers of degree recipients. I could just stop here because if I am unwilling or unable to describe the magnitude of costs, I am logically unable to allocate the burden of those costs among various sources of revenue. However, as you are well aware, problems of logic do not deter university presidents as they travel their appointed speaking rounds and I will not, therefore, permit them to deter me today.

Whatever the costs and whatever the products, funding medical education will remain a problem and funding medical education will remain a complex process. In viewing that problem and that process, I first believe that society, the people, the public--whatever we want to call our collective selves--require medical personnel. We support medical education for us, rather than for physicians or for dentists or for other health personnel. The public in its role as taxpayer, then, has a crucial stake in medical education--a stake much more crucial than is true of a student in medical education, a faculty member or clinician, or a medical researcher. Those of us who choose not to be physicians are doing quite well, thank you, and any person who chooses not to go to medical school will survive--provided that enough people do choose to go to medical school. Regardless of how wealthy a real or imagined physician may become, we, the people--rich and poor--rather than he or she, the physician, are the primary beneficiaries of medical education. There is no more reason to charge a medical student the major portion of the costs of schooling than there is to do the same to a basketball player or to the school teacher who becomes a wealthy university president. Depending upon the social importance one assigns to medical personnel, to basketball players, and to university presidents, there may even be less reason to charge full costs to medical students than to the latter two groups. Note carefully that I said, "There may be... ."

The social need for medical personnel is a national need (really an international need, but the complexities introduced by a recognition of that fact simply defy my grasp today). While we may argue unendingly about input criteria designed to ensure that State-supported medical schools serve only something called "in-State students," the fact is that at the output end of any educational program, one product is mobility of the "outputee." This fact is as true for Ph.D.'s as for M.D.'s, for journeymen craftsmen as for CPA's, or for cosmetologists as for certificated teachers. Stated advantages of education at any level are opportunity and mobility. Thus, each of us in this Nation has a stake in the output of medical education throughout the country and, thus, a heavy component of support from the people in their Federal or national taxpayer roles is legitimate and necessary. Too often we forget the many roles we play as citizens of a democratic republic. Each level of government is supposed to serve a specific set of purposes and each level impacts upon every other level. Each one of us is an integral part of a variety of governmental levels and it is not a case of "us and them." Our basic problem is to determine which of the many governments of which we are a part can meet what purposes best and to consider combination service and support packages where such packages make sense.

Because I do not believe in monolithic control over curricula or methodology in any educational undertaking, I believe in preserving State control in higher education through State support of higher education. Because of the major national purposes met by some programs of higher education, including medical education, I believe in Federal support of some programs of higher education. Thus it is clear to me that both levels of Government--State and Federal--must be involved in continuing and stable ways in the support of the costs of medical education.

Moreover, since funding from both levels is provided to meet public purposes, we in higher education and in medical education must be prepared to accept some public "strings" on those public support dollars. Our vigilance must not be designed to avoid all "strings;" it must be designed instead to guarantee that the "strings" are only those necessary for the attainment of public purposes and that they bear an intelligent and rational relationship to the realization of stated public purposes. If we wish to choose to attain our purposes without "strings" and even if we argue that our purposes coincide with public purposes so that "strings" are unnecessary, we must recognize that the logical result of such choice will be the diminution of public support and of public dollars on our behalf.

As most of you know, the "string" issue is at the heart of recent debates over the continuation of the Federal Health Manpower Educational Assistance Program. My view of these debates is that we in higher education vacillate in our views of governmental "interference" as they affect our prerogatives. We are quick to submit proposals for categorical support programs that have obvious impact upon our curricular freedom and quick to cite our need for absolute curricular freedom when othe funding proposals surface. In fact, our primary freedom is still our ability to accept or to refuse to accept governmental funding, and for a public university even that freedom is far from absolute. Public higher education derives from government and is funded to achieve public purposes. Our freedom must be recognized as existing within those limitations.

I will not attempt to produce some magic formula to reveal what portion of the costs of medical education should be supported by Federal funds and what portion by State funds. The answers to such questions are partly ideological and partly pragmatic in nature and no formula can be said to contain the absolute "truth." I tend to believe that the so-called "bread and butter" support is best supplied by State sources and that Federal support should be supplemental to State support. The correct proportion between the two sources, nevertheless, will vary from time to time as costs vary, as public purposes vary, and as tax structures at the two governmental levels vary. The creation and implementation of public policy--or politics--is not an absolute science and today's formula for success is too easily converted to tomorrow's formula for disaster. Just ask those public school systems with enrollment-driven support formulas how well those formulas are working today and the problems of reducing public policy decisions to mathematical models will be readily apparent.

I am now left with the questions of what costs the students should bear and of what costs patients in education-related hospitals or other clinics should bear. Here again, I face these questions from a pragmatic rather than from an idealistic point of view. I can argue idealistically that both students and patients should bear no share of the costs of medical education--the former because they are paying in terms of forgone income and because they will pay later in terms of tax support related to their income; the latter because they are randomly selected and because their circumstances do not logically single them out of the population as a whole as being eligible for special medical education assessments.

In reality, however, we long ago decided that the student in higher education should bear some burden of the cost of higher education through tuition and fees. We have developed complex tuition and fee schedules and have developed complex student financial aid programs to assist students in paying those charges. The overhead costs of assessing, collecting, and depositing student tuition and fee income and of determining eligibility for, awarding, and managing student scholarship and loan programs are viewed as necessary costs of doing business in higher education and obviously are here to stay. My pragmatic view of the student share of the support of his or her higher education, including medical education, is that history has seen the establishment of roughly consistent ratios between student fees and costs of education and that the future will see general faithfulness to those ratios. It is only as one attempts to develop theories to justify specific ratios on other than historical grounds that one falls into traps of logic and into arguments of almost a theological nature. I defy anyone to "prove" on any grounds that student charges at 10 percent of costs are more or less valid than student charges at 40 percent of costs. It is only as one approaches a student share either of no percent or 100 percent that true philosophical arguments make sense and neither share basis has represented nor will represent reality for many years. So as costs increase, student charges and student financial aid programs will increase but both will lag and will be directly related to prior decisions related to Government funding of medical education.

Finally, I arrive at the patient. My discussion to this point has not included a description of medical education. Now I must state that I consider medical education to include teaching in programs of undergraduate, graduate, and continuing medical education; research; and public service. In each of these areas of medical education I would argue on behalf of funding from both the State and Federal levels and on behalf of some support through student fees. To the extent that a patient receives medical services which are offered to meet medical education purposes--as opposed to the receipt of professional services which happen to be provided in a facility where medical education also takes place--I can find no logic in asking that patient to bear a special portion of medical costs. It could, as a matter of fact, be argued that the patient in a medical education facility experiences certain inconveniences (for example, student rounds) for which he or she might feel entitled to a discount. The most persuasive conclusion I can reach is that the inconvenience on one hand is equalled by the special high quality of a medical education facility on the other and that the patient should pay what he or she would pay without respect to whether medical education is occurring there. The costs of health care are different from the costs of medical education and should remain separate even though it must be recognized that the costs of health care for everyone do include components related to the costs of medical education. Health care costs and particularly professional fees are not an exact science and obviously include factors related to one's preparation to deliver health care or to the developmental costs of equipment and of techniques. But these costs are borne by all patients and patients are first of all citizens of a society. The costs of having health care ready for the citizen who becomes a patient should be, in my view, a citizen cost rather than a patient cost.

Before summarizing my comments, let me also mention the crucial nature of corporate and individual philanthropy and specialized programmatic support in any analysis of the support of medical education. While the total amounts coming from these private sources may be small when compared with the overall costs of medical education, these amounts often provide the crucial margin in research efforts, in student assistance, in library and other facility development, and in faculty and staff development. Any discussion of the support of the costs of medical education which overlooks the component provided through private gifts and grants is incomplete.

Although I am clearly dealing with generalities rather than with specifics related to the topic of "The Problem of Cost," I cannot escape the nagging concern that the cost of medical education is only a minor subtopic in the overall issue of cost, that is, the cost of the delivery of health care is of far greater concern than is the cost of preparing the medical delivery person. In the various cost indexes which are read by all of us each month, it is the cost of health care rather than the cost of medical education which has major national economic impact. I am not totally certain why it costs over $1,000 to provide my father with a room for 30 hours in which to die; I do not easily understand reported health care bills equalling tens of thousands of dollars which are faced by many in our society. To what avail are the costs of medical education if increasing numbers of people find themselves unable to afford the medical care our practitioners are prepared to provide? Is medical education treadding the same path already walked by teacher education? No one alert to the needs of our society today should argue with a straight face that we have too many teachers or that programs of teacher education should be reduced and even eliminated. Yet many do make that argument and do so with straight faces. It is apparently better in the minds of many to have too little education provided than to pay the costs of sufficient education. Is that view to represent a trend or are we still sufficiently persuaded that a long life--even an uneducated one--is important enough to induce us to bear the cost?

I recognize that the costs of health care are not included in my assigned topic, but we are talking about the costs of preparing people to provide a needed public service and the costs of providing that service are at least worthy of mention in this context.

In the symposium brochure, this session is described by two questions. The second question has to do with sources of funds and I have dealt with that area at some length. The first question asks how much America--in fact, the American people--can afford to invest in medical education. A Nation which pays professional basketball players an average salary of $108,000 a year; which supports an escalating number of amusement parks which cost a family of four an average of $120 to $150 for a 2-day weekend; which considers medium-priced cars to retail for around $5,500; and which supports a seemingly endless number of X-rated books, movies, and massage parlors can afford to invest in medical education whatever it believes it wants to invest. Our national question is not what we can afford, but, rather, what we want to support. Our problem as educators is to determine with the people the kinds of medical care they want and to determine the best ways to prepare personnel to provide that care. The people can afford the costs of those preparation programs regardless of the amounts involved. Our task is to ensure that those kinds of programs are what we are asking the people to support--even if that support may cost them a weekend at Disney World. If we are providing those programs, it may cause problems down there in Orlando.

THE PROBLEM OF COST

Critique and Challenge

Alton Blakeslee
Discussion Initiator

Mr. Alton Blakeslee: This being a bicentennial symposium I tried to learn from several medical historians what medicine was like 200 years ago. They told me that in 1776 physicians were held in very low esteem indeed. They had limited educations, they ranked low on the social ladder, and their fees were relatively small. The main methods of treatment were bleeding and purging, and seeing a doctor, apparently, was really hazardous to health. In the ensuing 200 years medicine has become perhaps the most respected of all professions. Nevertheless there has been some recent erosion of that position, perhaps because people expect too much from medicine. Moreover, the Art Sniders and Alton Blakeslees may unwittingly have contributed to that fact by reporting with excessive enthusiasm the research advancements which turn out later not to be as great as the initial research reports might have led us to believe. There is also envy or resentment of certain aspects of medicine, and physicians themselves contribute to this by their sometimes godlike behavior.

We are told, on the one hand, that it costs an average of $20,000 per year per student to educate future doctors. I think the public would find this a very high figure, particularly in terms of their own annual incomes. It would not be unexpected to have them ask if all that expense is justified. On the other hand, the background paper notes that $2 billion of tax money go to medical education each year; and if you divide $2 billion by 200 million people, you arrive at $10 per capita, which is only $40 a year a family of four is paying to educate doctors. My question is: Does the public have any concept of its role in providing future doctors? Do you think the people are aware of this responsibility, or the need for it?

Dr. Stanley S. Bergen, Jr.: I think the public is becoming more aware of this particularly as they feel the pinch of health care costs. The media are beginning to expose this story. Unfortunately, news stories are too often inaccurate and, not infrequently, are covered over by a heavy layer of emotionalism because this may be the springboard used for a political move by an individual or a pressure group. One of our failings as medical educators is that we have not made a concerted attempt to take our story to the public, to explain the elements of cost, and to contribute to an understanding of why they are as high as they are.

Mr. Blakeslee: The subsidy of medical education from tax money is higher than that for training in any other profession, is it not?

Dr. Bergen: As far as I am aware, yes. I have no idea what the Government puts into training an astronaut. It may cost more, but there are very few of them so it is not a comparable issue. Certainly among other professions, though, it seems there is no other group with support comparable to that of medical students and medical education.

Mr. Blakeslee: It has been said that faculty salaries make up the largest part of educational costs. In the background paper it was noted that the faculty to student ratio can be as low as 1.0 to 1.3, which is almost private tutoring. Is that really necessary? Is that an element of cost that would be reduced if education were carried out differently?

Dr. Roger J. Bulger: Well, actually, I think we may not know whether the quality of education in an institution can be correlated with faculty to student ratio. My own feeling is that we will begin to get answers to these questions because the national health bill is now higher than that for defense.

What worries me is that we do not have a consistent and generally accepted way of accounting for costs which would allow us to examine truly comparative data, then defend logically the institutional heterogeneity which is so valuable. I think an answer to your question ought to be forthcoming from any school, so that they could tell you convincingly what they do with the 1.0 to 1.3 ratio. I suspect there are schools where the ratio is so high (for example, 1:6) that you could argue it borders on the inadequate. But we need consistency in the data base if we are to be successful in describing and defending our positions. The costs are now so high that we are all going to have to start talking to the public in the same way about the same numbers.

It may be of interest to note that in the course of the Institute of Medicine study of costs a group of experts was asked to project the necessary teaching requirements for a new 4-year school for 100 students in each class, including how many hospital beds, how many residents, and how many graduate students are a legitimate element of such an enterprise. Their bare bones figure called for somewhere around 220 full-time equivalent faculty. The critical faculty mass to have a good medical school then is not small.

Mr. Blakeslee: Is the salary level for the faculty in a medical school seriously out of line with that of people who are training teachers or lawyers or other professionals?

Dr. Bergen: At risk of entering labor negotiations, I guess I have to say that it depends on what the faculty individual is doing. If individual faculty members are only teaching, not doing anything else, then yes, they are being overpaid. However, if you expect them to deliver patient care, to supervise house staff, to do research, and to carry out all the other public service missions of a medical school, then in the current spectrum of payment for professionals they probably are not overpaid. If anything, I think a case can be made, at least in some schools, that faculty are not receiving a wage or salary commensurate with what fellow professionals can get in private practice or in other endeavors.

Dr. Bulger: In public schools, at least, the educational portion of faculty salaries generally has the same range as that in other university divisions. Thus the basic science faculty generally receive the same salary as other professors. On the clinical side, however, supplements are often provided on the basis of what people earn in delivering patient care. Although those salaries have gone up, and seem very high in relation to those of anatomists, biochemists, and educators, generally they are in line with those in the open market place.

Mr. Blakeslee: We all know that the public is highly critical of the high cost of health care, of which medical education is a part. Society seems especially critical of the high income which physicians enjoy. The argument that this was justified by long years of "slave labor" in internship and residency is no longer as persuasive when the average stipend for those trainees is now $11,000 a year, which is about the average or median income of the American family today. How can that argument still be used when many people in other professions also have a long training period before they begin to produce personal income?

Dr. John E. Corbally: I think the argument has changed. For any college educated person there is some foregone income and it is particularly large for those who undertake programs that require up to 10 years or more beyond high school. However, the argument is not basically a wise one for physicians or anyone else. I could point out to Mark Splaingard that most of us have not yet been wise enough to figure out how to deal with the income tax problem through the magic of incorporation, which would undoubtedly change the calculations of income tax paid by the average underpaid university president or physician. We find, for example, that there are few individual physicians that we can put on our payroll any more because we have to deal with their corporations. That has nothing to do with their services, which continue to be excellent. It is a tax strategem and a legitimate one, but it does mean that some of the arguments about these fiscal issues are subject to discussion and interpretation.

I go back to the basic point of view that costs of medical care, of university teaching, of plumbing, of administration, or some other variable, are determined by the law of supply and demand. I guess the reason some of us feel distressed about what we have to pay physicians is not so much because we resent anybody earning that much money, but whether they give us for those dollars what we really think we would like to receive. If there were a better match between what we get and what we think we should receive, I doubt we would need to argue so much about the costs of medical care or how much a physician makes or the cost of medical education.

Mr. Blakeslee: Are there any courses in medical schools that cost a great deal but are not necessary? Is that part of the cost being reexamined or being continually examined?

Dr. Bergen: I really believe you cannot answer that question in any general way. Such judgments depend on the school and its determined missions. We have two medical schools in our system right now. The one located in Newark, in an urban environment with a disadvantaged population, has to mount programs different from the school located in the suburbs where there are other demands in relation to community hospitals. What may look to an outside observer as being unnecessary may have very good reason for being supported within that institution.

Mr. Blakeslee: How much of the cost of running a medical school reflects the cost of running affiliated hospitals? Are they run efficiently in relation to what they do cost medical schools?

Dr. Bulger: I think it fair to say that most schools do not transfer any significant educational subsidy to major or affiliated hospitals. Those hospitals would often like more support from the school and can make some particularly strong arguments for such support.

Mr. Blakeslee: Mr. Splaingard made the point that the average physician repays the Government the full cost of even the most expensive medical education through taxes in less than 20 years. Does that calculation imply that all of his taxes represent repayment for the Government subsidy of his education or is he also paying for roads and public schools and things of this sort?

Mr. Mark Splaingard: The point I was trying to make was that a physician, because of a higher income, pays more tax, and the difference in taxation levels would in 20 years repay without interest what the Government had invested in that person's medical education. I recognize, however, that this is an overly simplistic way to analyze a complex problem.

Mr. Blakeslee: The Millis report included a statement that the beneficiaries of medical education are the individual patients, society as a whole, and the physician. The patient benefits because medical service results; society benefits because there could be no public welfare without the well being of individual citizens; and the physician benefits because he is afforded the opportunity to gain a professional skill which will produce an unusually substantial reward in monetary, social, and personal terms. The latter idea implies that a physician has something to pay back. The Yale plan for repayment has been mentioned as one method for accomplishing this goal. How widespread are plans in which physicians support the medical schools from which they have graduated?

Dr. Bulger: Basically the Yale plan is an economic opportunity bank from which students borrow the money to pay for an education and repay an amount and at a rate based on income. What I am trying to wrestle with, as a representative of a public institution, is what President Corbally said about the philosophy of public education. My bias is that the level of physician income has now become a threat to the profession and I would rather compromise on the public education philosophy and attempt to have the profession, through the private sector and not through governmental agencies, pay back what has been invested in medical education.

THE PROBLEM OF COST

General Discussion

__Participant__: My question is prompted by Dr. Bulger's comment about uniform cost accounting and the issues that may be raised in connection with the National Health Development and Resource Act (93-641). Since medical schools are generally health care providers, they are included among the various health system agencies affected by the Act. What cost containment efforts will be demanded of medical schools, by their State coordinating councils, for the health care system that involves both the school and its own teaching hospital or affiliated hospitals? The question may at this point be unanswerable but it may become a significant influence in the next 2 or 3 years prior to institution of national health insurance.

__Dr. Stanley S. Bergen, Jr.__: It has certainly surfaced in New Jersey. We are having serious discussions and are feeling pressures upon our teaching hospitals. We have taken the position that they should be considered a different type of hospital and get some kind of favored treatment because of that difference. Thus far, the authorities have not agreed with that position. The coordinating groups are also beginning to ask how much they should be involved with medical education itself and especially in determining the number of students we graduate because that is one of the driving forces behind the cost of medical education. I think your observation is right; certainly in New Jersey it is arousing interest already.

__Participant__: The panel has attempted to defend the high cost of physician education. I have two questions: First, do you believe the public wants better access to physicians or better access to health care? Second, are increased physician manpower and better access to health care synonymous? Numerous health professionals are prevented by restrictive medical practice acts from providing services for which they have been trained. Would one responsibility of the medical school then be that of providing leadership in developing new models for health care delivery, maximizing the potential contributions of these health professionals, and thereby providing better access, cost benefits, and greater efficiency?

Dr. Bergen: I think the public is ambivalent on the first issue. Most individuals seem to want access to a physician. They are not convinced that care from other members of the team is equivalent. I think the medical school has a responsibility to foster team efforts and to use less costly methods of providing health care. We cannot dispense with physicians where they are needed. I do think it is our responsibility to encourage the use of other health professionals, to provide models, and to advocate the development of such models outside medical schools. It has certainly been shown that if you put a physician in an area that has no need for another doctor, you can be sure the additional physician will generate an added $200,000 cost in health care. If we put physicians where they are not needed, or if we graduate more physicians than are needed by the country and they contribute to further poor distribution, we will certainly continue to escalate the cost of health care. However, if we can find a way of encouraging physicians to go where they are needed, we may avoid that effect.

Participant: It has been said that the most important thing in the world is not money but love, and that doctors are very fortunate because they love money. Our panelists this morning have emphasized time and again that doctors are a national resource, but they do not seem to have come out four square in saying that if physicians are a national resource and if the Nation is providing for their education, then they have a service to provide to the Nation. I would find it helpful if I could hear from the panel whether they would support the view that if medical education is being significantly supported by the tax dollar, the product of that education owes a period of service in return and that such practice would be a reasonable way for us to function.

Mr. Mark Splaingard: I think it is hard to disagree that we have a general responsibility of that kind. The problem is with the specifics that have never been worked out satisfactorily. How long must a medical graduate work at what, and where? It is with the particulars, not the general principle, that gets everybody so upset.

Dr. Roger J. Bulger: I can easily answer this because I am too old and incompetent to have to serve: I think we must recognize and accept this responsibility. There is a question, for example, as to the constitutionality of a draft. I think the current manpower bill is very workable. I would also note that the profession itself can, and should, address this question of providing more adequate health services to all the people wherever they are located.

Dr. Bergen: My answer is yes as long as it is equitably done. That is the only stumbling block right now.

Background Paper

4. ONE WORLD OR MANY: AMERICA'S ROLE IN MEDICAL EDUCATION

America has a long and honored history of contributing to the medical education programs of less developed nations. Before 1940 missionary organizations and the Rockefeller Foundation were the prime sources of this assistance, making major contributions to the establishment of more than a score of medical schools in other lands. Since 1940 the pace has quickened as other philanthropic agencies (such as the Kellogg Foundation, the China Medical Board, the Commonwealth Fund, the Milbank Memorial Fund, and the Josiah Macy, Jr., Foundation) have made capital, operating, and fellowship grants to strengthen the medical education systems in countries where such help was needed. Increasingly, the Federal Government, operating through such units as the Agency for International Development and the National Institutes of Health, has offered substantial assistance both directly and through American universities to the solution of still serious health manpower problems in the developing world.

In this historical perspective there can be little doubt of the genuine concern America has exhibited for those in need, and the sincere efforts it has launched to assist them. But as one thoughtful American observer has noted, all of these efforts "whatever their positive values, have been piecemeal (and) opportunistic. All have attempted, more or less successfully, to transplant or to adapt Western educational methods to developing countries." America is not alone in such behavior, but it may inadvertently have contributed to what are now seen by a major international organization as being among the most significant problems in health manpower production. These include:

> . . . wide divergencies between academic and training goals on the one hand and service requirements, consumers' expectations . . .

> life style, and (most important) the general socioeconomic situation on the other; and consequently unsuitability of curricula, methods, and evaluation for the training of health workers to meet community health needs and to work in teams, educational programs being primarily directed towards medical and institutional curative care and largely irrelevant to the tasks required outside institutional settings or in health promotion, preventive work, and rehabilitation. . . .

There are growing numbers, both at home and abroad, who now feel that our sincere efforts may in fact be encouraging the development of educational programs that are inappropriate to the needs of nations we want to help--and in at least one respect there is even some question about our sincerity.

This latter feeling is pointed up by several facts. During the last 10 to 15 years, the number of foreign students admitted annually to American medical schools has ranged from 120 to 190, or a relatively steady 1.3 to 1.6 percent of newly admitted students. In graduate education (internship and residency training), however, the situation has been very different (see Table 1).

Table 1. Foreign House Officers By Number and As Percent of Total Medical Student Population.

Year	Foreign House Officers	Percent of Total
1959-60	9,457	22
1964-65	10,974	27
1969-70	14,999	31
1973-74	19,333	31

In addition, the number of other trainees (usually those in specialized programs such as postdoctoral research fellowships which carry no significant patient care responsibilities) rose from 1,925 in 1964-1965 to 4,106 in 1971-1972. Since then the number has been receding so that in 1973-1974 there were 3,499.

There is little suspicion of self-serving motives in the admission of foreign students to medical schools (although in some quarters there is a belief that the basic medical education here may not be best suited to those from other cultures and socioeconomic systems). Suspicion is only slightly higher in connection with special training programs. In contrast, there is widespread question of our motives in offering internship and residency training to such a large number of foreign nationals. It is heightened by the aggressive recruitment programs that some American hospitals carry out in other nations, the absence of any significant effort to fashion internship and residency experience to prepare trainees for dealing with the most pressing health problems of their own countries, and the inescapable evidence that large numbers remain in the United States serving our needs rather than returning to their homelands which provided their general and basic professional education and which usually have a desperate need for their services (for example, India, which provides 19 percent of the foreign interns and residents in the United States; or the entire Asian subcontinent, which is the source of 65 percent of these trainees).

Some writers have suggested that it is not so much the attraction of America as the lack of opportunities at home which leads so many foreign medical graduates to seek further training here, and then to remain in a setting where it is both easier and financially more attractive to practice what they have been trained to do. Many countries recognize their own deficiencies in these areas, and are striving to correct them in an attempt to stem the outward flow of trained personnel. Clearly, these countries need help. The question is whether our present efforts, in fact, are helpful.

Since there is no reason to believe that the interest in international medical education of foundations, the Federal Government, or individual universities will disappear, it may be timely to reexamine the nature of these institutions' activities. Is what they offer to foreign medical students and special trainees a kind of education that is needed in the countries of origin, and can it be used in those countries? Is what we export through short- and long-term consultants an effort (conscious or unconscious) to transplant American attitudes and methods to other countries, or an attempt to explore with them a variety of options from which they can select in whole or in part what is best suited to their specific needs?

The problem of graduate medical education is more difficult to resolve. It is already being addressed in national health manpower legislation now under consideration in Congress.

But this represents a restrictive approach--a proposed ceiling on numbers--rather than an attempt to find some way to make more appropriate to the needs of the countries from which foreign graduates come the educational experience they are offerred. There is, at least in some foreign settings, a strong feeling that the proposed restrictive legislation will be most useful to them, because we in the United States simply do not know enough about their needs to fashion an appropriate educational experience for interns and residents. Nevertheless, say these critics, even if we did have such knowledge, it is the attitudes and values acquired by living in America, more than anything gained in the formal educational program, that are incongruent with the needs of the developing world.

These are some of the issues which the symposium panel should address with attention to the following specific questions:

- Are such criticisms of American assistance programs in medical education widespread?
- What are the greatest needs in international medical education to which we should give attention?
- Are there ways in which we can use our resources more effectively in assisting developing countries to strengthen their medical education systems?

ONE WORLD OR MANY: AMERICA'S ROLE IN MEDICAL EDUCATION

John H. Bryant, M.D.

Introduction

The background paper for this conference on America's role in international medical education states that American contributions to medical education in developing countries:

- Have been piecemeal and opportunistic.
- Have inadvertently contributed to problems in health manpower production (and, I will add, distribution).
- Have been exploitative in using foreign medical graduates.
- Have tended toward transplantation of American ideas.

I could quarrel with the words and insist on exceptions but I am in general agreement. My major problem with these particular issues, however, is that they distract us from the central problem and lead us to the wrong questions. They focus mainly on the style of American contributions and would lead us to discuss how America might be less opportunistic, exploitative, and intellectually paternalistic. These matters of style are important but secondary. The central problem is that medical education is, to a significant extent, socially dysfunctional. That is a worldwide problem, but its manifestations in the developing countries are extreme to the point of human tragedy. The central questions, therefore, have to do with America's contribution to that problem, the extent to which we, as Americans, will face what I consider to be a major ethical dilemma of medical education, and the extent to which our resources are relevant to working with the problem.

This presentation falls into four parts. I will begin by describing some national needs of developing countries toward which I believe medical education should be directed and then identify some major failures of current patterns of medical education in relation to those needs. I will describe as well some relevant American resources and, finally, how they might be used more effectively in dealing with the most salient of these problems. Along the way, I will try to show how some lessons from the past may assist us in being more effective in the future.

Medical Education for What?

Our ultimate concern, I believe, is for the health of all the people of a region or country, and our interest in medical education is directed toward that end. I state this unreservedly as a matter of social justice (Bryant in press). Understanding of this issue should be unequivocal. This position requires that medical education be judged finally not on its theory, practice, and internal refinements but on outcomes related to the health of the people and the health services they receive.

We need to ask, therefore, what are or should be the circumstances and arrangements for addressing the health of the people and their needs for health services, and what are the implications for medical education? We will look at those circumstances and at some of the key faults in the provision of health services.

To begin with, health and health services cannot be separated from the larger socioeconomic and environmental circumstances in which people live, and one of the great difficulties facing health care and therefore medical education is how to integrate more closely with other sectors of community and national development.

Poverty is a central problem in the developing countries and health and medical education are inextricably related to it. There are 750 million people in poverty in the developing countries, 85 percent of them in what the World Bank refers to as absolute poverty (World Bank 1975). The intransigence of the problem is reflected in the glacial slowness of improvement. Between 1960 and 1972, the per capita gross national product in the developing countries increased at the rate of about 1 percent per year. Governmental expenditures on health (in real dollars) decreased at 2.1 percent per year (Sivard 1974).

While these data have their place, we must keep in mind that such economic measures describe a narrow aspect of human life and development, just as the usual indicators of health status, such as mortality and morbidity, are limited measures of health and health services. A challenge is to find ways of conceptualizing life and development in human communities in terms that go beyond such measures. Life has greater purposes than to live long and contribute to GNP!

The great problems of providing health services in developing countries center on extreme limitations of resources and wide dispersion of populations. Governmental expenditures for health services are often less than one dollar per person per year. Further, relatively few people are reached by modern health services--fewer than 5 percent in some countries; 15 percent is a more usual proportion; unusual is a proportion of 40 or 50 percent (Mahler 1974).

I emphasize that resources are extremely limited and that large portions of the populations of the world have little or no access to health care, so we shall not escape from understanding their deprivation as we look at the implications for medical education. Further, we must see that this is a long-term, not a short-term, problem. The problem is not merely one of limited resources; the resources that are available are often not well used. Many shortcomings in the provision of health services could be identified. Some that have important implications for medical education include:

- Shortages of physicians. Ratios range from one physician for a few thousand population to one for several hundred thousand, the latter, incredibly, almost the rule in rural areas where most of the populations live (Bryant 1971). The problem has two aspects: an obvious and appalling quantitative shortage of physicians, and a more subtle but crucially important qualitative shortage of physicians who are prepared to deal with the special problems of providing health services to large populations with limited resources.

- Orientation of health services. Health services are largely oriented toward curative services with inordinate investments in hospital-based services rather than in more balanced programs that also emphasize promotive and preventive programs at health centers and in communities. There is limited interest and competence among physicians for developing these emphases.

- Inadequate use of paraprofessional and village personnel. A special case is the delegation of simple medical care tasks to nonphysicians, which can free physicians to assume leadership roles in developing broadly oriented health care programs. A continued widespread reluctance to delegate these responsibilities constitutes a major obstacle to the reform of health services (Bryant 1971).

- Inadequate use of community resources. The poorest communities have resources that can support health care efforts. Among these are manpower, ideas, crops, dwellings, and, often, money. In addition, the community itself can often most effectively pursue some of the most important initiatives in health care--education, nutritional programs, environmental changes, simple medical care, and identification of those people in greatest need of health care (Newell 1975).

The Response of Medical Education

Thus, health services reach only a small part of the population and even then they often fail to relate effectively to the broader needs of the population. The importance of this larger problem for medical education is the crucial role of physicians in providing care, in leading others in the system for providing care, and in shaping local and national policies for both medical education and health services.

For the purpose of this discussion, let us focus on the particular and most salient national need, which is for physicians who are interested in working in the locations of greatest need, particularly the rural areas and urban slums; and who understand the technical, clinical, ethical, and social issues involved in developing broadly oriented health care programs for large numbers of people with limited resources.

Medical education in developing countries has generally acknowledged these needs and developed educational programs directed toward them, but the results have been almost uniformly marginal. The programs have had varying effects on professional competencies, but they consistently appear to have had limited influence on career decisions. A pattern seen again and again is that a very small proportion of graduates choose voluntarily to work in areas of great national need, and, when compelled, their resistance to service is often high and their motivation to function effectively is low.

A key issue is cost. When only 1 in 20 graduates chooses to work in a location of national need (that is a realistic proportion), the cost in public funds of placing a physician in such a location is 20 times the unit cost of physician production--a half million to a million dollars! The remaining 19 graduates choose to migrate to other countries or to work in the major cities where their contributions to national need may be negligible. Thus, there is vast slippage between the investment of public resources and the return to society in terms of effective services provided (Bryant, February 1976; World Health Organization 1975; World Bank 1975).

While the problem of career choices is extremely complicated, I will address it from two points of view, one having to do with medical education directly, the other from a more general perspective.

First, a reason for the limited influence of medical education on career choices has to do with the type of educational "solution" developed for it, usually in the form of a department (or occasionally an interdepartmental program) of social and preventive medicine or community medicine. This type of solution follows the evolutionary pattern of medical schools in which a new department is added when a new discipline or educational emphasis is required. While this mode of institutional development may be well suited for adding new content to the curriculum, it is poorly suited for dealing with the entirely different problem of shaping career interests and choices. The mission of the department of community medicine is completely overshadowed by the remainder of the educational environment and experience. Technically sophisticated, specialty-oriented, largely hospital-based experience is provided by a faculty which has made its own commitments to that kind of setting and to what it clearly believes to be intellectually exciting, professionally prestigious, and economically attractive. In contrast, the effort of a department of community medicine may be logical in direction but is generally inadequate in scale vis-à-vis the context in which it must function and the outcomes that are required.

Different positions can be taken on this problem of medical education. One is to acknowledge that there are internal conflicts among the missions of medical education and that competition for student interests and career choices is inevitable and appropriate. Medical education must strive to be at the forefront of modern biomedical science. For it to be otherwise as a matter of policy would be dangerous to the concept of higher education and short change both the student of medicine and the public that has or potentially might have access to health care. This mission will include specialty and subspecialty medical care in university hospital settings, though strong efforts should be made to develop a balanced involvement by the medical school in the full range of health problems and health care settings reflective of national needs. The final outcome of career patterns of graduates will depend on individual student choices, influenced temporarily perhaps by some form of governmental service.

Another position is that the actual needs of the public must take precedence, that current approaches to medical education and physician recruitment are grossly inadequate and scandalously expensive and that ameliorative steps taken by medical educators are ineffective and amount to what Robert Alford calls "dynamics without change" (Alford 1972), an elaborate charade in which the problem is identified and solutions developed that represent minimal divergence from established patterns of medical education and practice, but which can be used politically and professionally to show that something is being done.

The problem of medical education then is a multidimensional social problem in which well-reasoned arguments can be aligned one against the other. I take the position, however, that the mission of medical education is rationalized; that vast and precious public resources, generally allocated to medical education for the purpose of bringing health services to the public, are used in ways that fail that purpose. The dilemma involves what is widely considered to be excellence in medical care, together with associated professional and personal opportunities, drawing students away from socially necessary roles serving public need. I am not sure how to balance medical education with public need, but there should be a way. Any consideration of American involvement in medical education in developing countries should deal with this problem directly, not only as a matter of technical interest, but also of moral responsibility.

Another question one might consider is to what extent career choices such as location and specialty are actually problems of medical education. The determinants of those choices are broad, including factors such as personal and family sense of what a physician should be; national, social, and economic values relating to physician roles; professional and social amenities associated with practice settings; personal economic return; substantive content of the type of practice; and so forth (Taylor et al. 1975, World Health Organization 1975). While medical educational experiences strongly influence some of these determinants, one would be oversimplifying to consider the matter solely an educational problem. If this is so, approaches to the problem should extend well beyond the boundaries of medical education.

What Are the Relevant American Resources?

In considering the contributions that America might make to medical education in developing countries, one should focus attention on two problem areas described earlier: 1) health care programs that are more effective in reaching populations with limited resources; and 2) medical educational programs that will prepare physicians with the motivation and competencies to function effectively within those health care programs.

In the development of health services, the United States has rapidly growing capability in such areas as health planning, coordinated networks of health services, use of varied health personnel teams, development of telephone and television communications, and use of computerized data systems. Some of these, if carefully selected, can be applied to the health care problems of developing countries. Nevertheless, one must remember that the United States has had virtually no experience with the special problem of providing health services to large, often dispersed, populations with severely limited resources (the current per capita expenditure for health in the United States is 500 to 1,000 times that for much of Asia and Africa) (World Bank 1975). The past gives us cause to worry that the indiscriminant use of technology intensive, data heavy, and cost insensitive approaches to health care will constitute a new generation of irrelevancies transplanted from the United States to developing countries.

In medical education, America has undeniable strengths. The irrelevancy of some of those strengths for developing countries and the distortions caused by them have already been alluded to. Beyond these, there are areas of American medical education that can be useful to developing countries and which, by their nature, will be relevant to local interests. As a leading example, the principles and methods of planning and evaluating medical education provide guidelines for foreign nationals to develop their educational programs according to their own needs and objectives.

Beyond these capabilities relating directly to health services and medical education, there are more general characteristics to be drawn from America, including:

- Flexibility and adaptability.
- Willingness and even interest in breaking with the past.
- Creativity and innovativeness.
- Willingness that often amounts to audacity in tackling complex problems.
- Openness to criticism and self-criticism.
- Ability to keep up to date in one's field.

These characteristics of style and function are, of course, not unique to Americans but they do occur regularly. More importantly, they may be applied in working with foreign nationals who often deal with complex and sometimes oppressive problems, particularly in the bureaucratic structures within which they must function.

But with these strengths come flaws that often misdirect and compromise the potential contribution of American technical assistance efforts (Bryant, April 1976). One of these flaws is seen in a pattern repeated over and over: A problem is identified and a solution developed, often at high cost and with years required for implementation. Later, it turns out that the understanding of the problem was superficial and the solution, though perhaps logical in direction, was ineffective. Usually the problem has underlying causes and relationships that are not seen, and the solutions are not of the force and direction that take those issues into account. There are at least two sets of reasons for this pattern of failure, one having to do with Americans, the other with the problems themselves.

First, many Americans (not only Americans, of course) have a mistaken confidence in their ability to solve problems, probably derived from American historical successes in dealing with technological problems. This assumed ability is applied to a variety of problems, often uncritically, including those associated with medical education and health care, which are frequently of a social nature and not easily amenable to solution.

Second, the problems themselves represent traps for the unwary. They have layers of complexity that are difficult to discern, and the solutions often have unintended outcomes that appear in at least two forms.

Some solutions are marginal in effect. The example has already been given of the preparation and recruitment of physicians for national need. The weaknesses in dealing with this problem are at least twofold. The usual solution is to set up departments of community medicine, but these are too weak as instruments of change when simply added to the existing structure and content of medical education. Further, the problem is usually seen as a medical problem, a view which defines the problem too narrowly; and the failures are then seen largely as educational failures, a view which assigns failures too narrowly.

Another example, this time taken from health services, is the use of auxiliaries, such as medical assistants, as a solution to the physician shortage problems, a solution that is in the right direction but falls far short of bringing health services to total populations. In actuality, it is necessary to go beyond auxiliaries to the use of village health workers, who represent another social or manpower resource.

While failures and marginal efforts often follow from inadequate understanding of problems, at other times they are due to forces beyond the control of those involved--a project may be thwarted by unpredictable events, such as rampant inflation, or there simply may be bad luck, such as the loss of crucial local leadership.

Unlike those solutions that are marginal in effect, some become part of the problem. The most famous example here is that health care programs developed to deal with widespread disease and disability in developing countries have contributed to the problems of population growth. As another example, the effort to address the health problems of developing countries through high quality medical education has resulted in young physicians choosing areas of practice other than those of national need.

More Effective Uses of American Resources

Since current modes of medical education are often socially counterproductive, American contributions to medical education in countries of the developing world must be formulated carefully. There are at least five areas of activity in which initiatives could be constructive. They include:

- Health services related to population needs. The limited experience of Americans in dealing with the special problems of providing health services to large populations with extremely limited resources should be noted. Emphasis should not be on transplanting components of the American health system but using American creativity in searching with foreign nationals for improved approaches for their own settings. Examples include finding new modes of using community resources for health care; formulating new measures for evaluating the contributions of health care to health and to individual and community development; and methods of using limited resources for health services that take into account total population needs and the differential needs of individuals and population groups.

- Public investment in alternatives to undergraduate medical education. Due to the great slippage between public investment in medical education and return in terms of serving national need, there should be pursuit of alternatives that might yield greater returns. If new resources are not available, funds could be recovered (over the great opposition of medical educators) by reducing the numbers of medical students (particularly under circumstances in which a limited proportion choose to work in areas of need) and reducing investments in university hospitals. Some examples of these alternatives are:

-- Greater attention to the continuing education of those physicians who have chosen to serve in areas of need, including substantially increased preservice and inservice education.

-- Priority to improving the conditions of service in areas of need, including: improved housing; experiments with clustering physicians and other professionals involved in regional service programs as a means of improving the social and professional environment; improved arrangements for schooling of their children; improved professional resources such as laboratories, communications, and consultation systems; and increased financial incentives (Bryant 1976).

-- Increased emphasis on research and development in health services with field health personnel participating, both to improve health services and to add to the sense that the problems are a matter of concern and that local initiative is welcome. Indonesia is doing this, and its motto, "let a thousand flowers grow," has stimulated initiative and improved morale in rural service.

-- Increased emphasis on the education of paramedical and village health personnel, including attention to education methods that should match that given to medical education. These students should be brought into closer relationship with educational programs for physicians and other health professionals.

- Broader approaches to physician recruitment. Such approaches might include efforts to shape national public understanding of problems through the press and through professional and public discussions; attempts to orient prospective medical students toward a different image of the professional life of physicians; and the use of criteria of selection directly related to service in areas of need.

- Increased effort to develop a cadre of American professionals in international health. These men and women need to understand both the problems of the developing countries and how resources of America can best serve in those countries.

- New approaches to medical education. Radical experiments in medical education are called for that have the overriding objective of producing physicians who are committed to serving in geographical areas of national need and who are competent to function in a service role. Program elements should be explicitly directed toward that purpose. These should include: formulating educational objectives and curriculum, locating the educational programs, developing the academic structure, selecting faculty, recruiting students, formulating modes of student and program evaluation, and establishing conditions of licensure and postgraduate placement.

Just how to structure the changes necessary to accomplish this objective is complicated; part of the problem of career choices lies outside of medical education, and most of the problem of professional competency is divided between undergraduate and graduate medical education. But some suggestions can be made.

For medical education to have a significant impact on these problems, I believe it must move strongly in the direction of: 1) focussing educational and research programs on local settings and problems and seeking a kind of excellence that is relevant to local needs rather than to the international scene; and 2) presenting students with a narrower range of career options, established through explicit statements of institutional purposes; corresponding program structure, content, and faculty; and the process of student selection.

This narrower, locally oriented emphasis is based on my belief that all medical schools need not and should not produce the omnipotent international physician.

To provide more specific illustrations, I propose that the programmatic direction could include the following elements:

- Locate the school in a rural area.
- Eliminate the traditional university hospital and base the program upon local communities and health facilities.
- Minimize or eliminate departmental emphases, which tend to recruit students to specific disciplines, and integrate the clinical disciplines into patient and community health care programs.
- Develop graduate medical education programs that form a continuum with the undergraduate program, choosing specialty programs with care, and explicitly avoiding graduate training in subspecialty clinical fields.
- Focus research on local problems to include diseases and their management with respect to local resources, provision of health services, communities in relation to health and health services, and relationships between health and development.

Such an approach would create new problems and risks for medical education, but these problems and risks have to be balanced against the fact of continued and extensive deprivation among many of the world's populations.

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ONE WORLD OR MANY: AMERICA'S ROLE IN MEDICAL EDUCATION

V. Ramalingaswami, M.D., D.S.C.

May I, at the outset, pay tribute to the contribution the United States of America has been making to the strengthening of medical capabilities in the developing world? A major part of this contribution has lain in recent times in the training of clinical specialists and researchers in biomedical sciences. Some of the trainees now occupy positions of responsibility in teaching, research, and specialized medical care in developing countries and they are in a position to influence health service patterns and health manpower development in those countries. I would like to discuss the critical issues facing the developing world in medical education and indicate the kinds of responses needed.

Introduction

It is clear, of course, that developing countries are not a homogeneous group. They vary considerably in the degree of development, the texture of their societies, their economic levels, and in the trends, speed, and directions of their progress. Notwithstanding their diversity in these and several other respects, they do present in their health scenes some common characteristics and broad similarities. There is a wide gap that separates acutely felt (but largely unmet) health needs and the resources available to meet them. Moreover, there is an equally wide gap between what medicine can do and what it actually is doing--between the possession of knowledge and socioeconomic ability to translate that knowledge into the reality of the local setting. Little congruence exists between the role of the physician and the needs of society; little equilibration can be found between medical education and health care. The medical education system and the health care delivery system seem to have gone separate ways, each uncritically adopting the prevailing patterns of industrially advanced countries. Each focused on individual hospitalized patient care to the detriment of front line primary health care, on curative services to the neglect of preventive services, and on urban orientation to the neglect of rural areas. Severely limited resources were being drained away in the provision of advanced levels of medical care to a relatively small segment of the population. The health manpower structure became distorted, taking the form of an hourglass rather than a pyramid (Taylor 1976). The value of indigenous systems of health care had been denigrated. Overcentralization of authority and compartmentalization of services had become obstacles to integrated, comprehensive health care. I have recently described the essence of present-day health care systems in the developing world, in a slightly dramatized way, as overcentralized, overprofessionalized, overfragmented, overexpensive, and overmystified (Ramalingaswami 1976).

Educational and training programs frequently have become irrelevant and dysfunctional in relation to local needs. The structure of the curriculum, the interests and attitudes of the faculty, the social status of the specialist, and the whole environment of the urban teaching hospital militated against the student-physician acquiring a live interest in community health problems. Teaching hospitals were constructed with no meaningful links with the health stations in the community. Curricula had been repaired from time to time but fundamental changes were few. Despite the striking differences in the health status, health needs, and resources between the developed and developing countries, it is astonishing for me to see how homogeneous and uniform are the patterns of medical education around the world. I am speaking from personal experience in India, the United Kingdom, and the United States of America. Family medicine, general practice, and primary health care do not attract able men and women. Our most competent men and women have not been addressing themselves to the most serious problems in health care. A recent study among interns carried out in India by my wife demonstrated that among 18 subjects tested for their appeal for further study after graduation, the subject of preventive and social medicine vied with anatomy for the last position (Ramalingaswami and Neki 1971). There is nothing new in what I have stated here. Many of us have sung this familiar song on many a platform. What then are the real needs of medical education in developing countries?

Needs of Medical Education in Developing Countries

While the method of medicine is scientific, its purpose is social. The scientific basis of medicine remains the same whether it is practiced in Chittagong or Chicago, but the circumstances of its application differ with local priorities and the social, economic, and cultural circumstances of the local setting (Ramalingaswami 1967). We must remember that, at the present stage of our development, institutions responsible for education and training of health personnel have an opportunity to influence national development and can be instruments of social action by changing the conditions that hamper the application of existing knowledge. The doctor is still respected, even revered.

The first priority need is a system of education oriented towards the promotion of community health and primary health care, a system that is linked unmistakably to the social and economic well-being of people and to national goals of development (Ramalingaswami 1973). The goals of education for medical and allied personnel need to be clearly defined in terms of meeting the health needs and disease patterns of the community. These general goals need to be translated into specific goals and appropriate instructional methods, curricula, and evaluative procedures instituted. The health profile of the population; extent of outreach services; economic status; cultural factors; the relative roles of governmental, nongovernmental, and voluntary agencies; and a host of other factors which vary between countries influence course content and learning situations. In a country like India, for example, medical education must reckon with the demographic imperatives that nearly 40 percent of the population are under 14 years of age, crowded, as Bryant (1969) said, in an environment loaded with the causes of disease and death. The health scene is characterized by poverty, by a high rate of infant and child loss compensated by a high birth rate, and by a disease pattern reflecting the synergistic interaction between malnutrition and infectious disease. There is a cluster of causes and a multiplicity of effects, making it both economical and rational to employ an integrated approach with a package of services rendered by a health team. In a setting such as this, the physician must function and lead the health team. A high proportion of patients will be children and most of the problems will relate to the community and the environment rather than to the individual (Commentary on a Conference 1971). The physician should be able to use illness-related curative activities as an entering wedge for reaching the community with preventive health services. Thus medicine does not depend upon adding a few hours of rural medicine to, or of subtracting a few hours from, anatomy in the curriculum. It does not even depend upon adding some psychology and social science, a touch of biostatistics, and some field trips now and then. Fundamental changes are needed, changes that will deculturalize the present system and reculturalize it, leading hopefully to behavioral change, a rehumanization if you will, of the agents of health care (King 1965). If community medicine is to grip the imagination of students, it must be based on scholarly foundations. It must present human beings and their environment as a biocultural science through an interdisciplinary, holistic approach. It must encompass human evolution, population dynamics, the connection between demography and disease, fertility and health, the features of rural and urban environments, host-parasite relationships, human growth and development, human nutrition, and patterns of health and disease as functions of the total environment (Boyden 1969, Ramalingaswami 1972).

Responses Needed

Medical care of the future depends upon medical education of the present (Gregg 1956). Many developing countries, aided by such organizations as WHO, are making efforts to correct the distortions and incongruities I described in their health service and medical education systems. Conscious efforts are being made by their governments to extend community outreach of preventive and curative care. Sizeable infrastructures have been built in the community. Several interesting and novel models of health care are being experimented upon in different parts of the developing world (WHO 1975, UNICEF 1976). Reorientation of medical education to community needs, restructuring of auxiliary cadres, and introduction of a new type of communist-oriented health worker are being attempted. High priority is being given to integration of nutrition, fertility regulation, immunization, and primary care services at critical life points. Health care delivery and medical education systems are being planned together. In my country, for example, a group on medical education and support manpower has articulated these concepts in a report recently submitted to the Government (Government of India 1975) and the Government has initiated steps in the past few months to involve the medical colleges in a massive new commitment to medical and auxiliary education.

Encouraging as this trend is, current efforts are still small and scattered in comparison with the colossal nature of the task and its urgency. The ongoing experiments on alternative approaches to health care delivery and health manpower development leading to integrated services covering promotive, preventive, and curative aspects, with widest possible coverage and equal accessibility of services to all citizens, need to be supported. Institutions that are striving to establish community-oriented medical education and to train physicians in the culture of their countries need to be identified and assisted in a meaningful way.

What about the more traditional role the United States has been playing in training specialists and researchers? No one will deny the need for clinical specialists--surgeons, gynecologists, ophthalmologists, and so on--and for researchers to create the scientific and technological base required to render the health services more efficient and effective. Training of people within these categories is necessary for the development of indigenous expertise to solve local problems and for the achievement of medical self-sufficiency within the country. One cannot advocate on either/or approach as, for example, primary care now; secondary care later. Primary, secondary, and tertiary health care and competence need to be developed in relation to one another and with due regard to the urgent need for primary care in the context of scarce resources. In this light should be viewed the internship and residency training programs for foreign medical graduates. Largely determined by the needs of U.S. hospitals, these programs tend to aggravate what is already a difficult problem for developing countries, namely, how to wean candidates away from the more glamorous clinical specialties into socially more important endeavors and how to reduce professional piling up in metropolitan areas. Is it possible that advanced training in the United States could be made supportive of and not counterproductive to the measures developing countries are taking to restructure their health services and manpower development to meet the elementary health needs of their populations?

Talent Flight

Much has been written about the flight of medical talent from developing to developed countries. Medical migration is not a new phenomenon but its excessively unilateral direction (from developing to developed countries) and its volume have now become substantial and serious. This occurrence is a complex one and a variety of push and pull factors are at work. A decade of deep concern and study has not led to any substantive action. Some believe that, ultimately, economic growth will take care of this problem (Baldwin 1970). However, the problem may not be amenable to direct attack. It may instead be an expression of human choice and so perhaps resistant to suppressive legislation. Nevertheless, through understanding and through joint initiatives from both sides, a process of change could be initiated. Let me say as well that there is much that we in the developing countries should be doing. Oscar Gish (1976) recently identified maltraining, maldistribution, overproduction, and low effective economic demand as some of the factors underlying medical migration. Medical talent is a productive investment, not a social overhead (Parthasarathi 1967). We need to develop a sound strategy within our own countries that prepares and retains our health manpower to serve our needs. Our manpower policies must be related to our developmental needs. We need to set up more effective mechanisms for repatriating nationals working abroad. This is a problem that has caused deep concern to my country which initiated several measures, the most well known of which is the creation of transitional positions for returning scientists on their way to permanent home institutions. The loss of nurses from developing countries to the affluent countries not only of the West but also of the Middle East is another problem causing deep concern.

On the side of recipient countries, several measures have been suggested (Baldwin 1970)--improving counseling services for foreign medical graduates before and after their arrival, increasing the output of medical personnel trained in the United States, and assisting developing countries in their experiments with alternative models of health care delivery and health manpower development to reduce dependence on overtrained physicians. The causes rather than symptoms should be tackled.

Conclusion

I would like to conclude with a reference to the Mother Goose rhyme "Who Killed Cock Robin," which is somewhat analogous to what Dragstedt (1962) did some years ago with regard to the career of a brilliant medical scientist. My Cock Robin is a medical student in a developing country who, like his colleagues, is full of idealism to serve humanity and work for people when he enters medical school. I do not doubt his sincerity despite its monotony. He, along with his colleagues, finds little reinforcement of his idealism as he moves from semester to semester in medical school. He, like his colleagues, loses his initial spontaneity and naturalness and, by the time he is an intern, becomes what the late Alan Gregg (1956) used to call a protective stereotype. This is Stage 1. After graduation, he, like his colleagues, wishes to specialize in a clinical area and stay in the teaching hospital where the "best" doctors practice the "best" medicine. Returning to his own community is an expression of failure. Taking up community medicine as a postgraduate career is second class. This is Stage 2. After spending 3 or 4 years in postgraduate work and acquiring a postgraduate qualification in a clinical area, he goes to a developed country, starts perhaps as an intern or junior resident, and works his way up in a totally new environment. He maintains his initial intent of returning to his country to utilize his training there. As time passes, slowly, insidiously, the urge to return turns into desire and desire into a philosophic resignation. He now has the green card! This is Stage 3.

These are the stages in the mortification of Cock Robin. They are real and poignant and cry out for correctives at each stage. We cannot afford to forego addressing ourselves to these problems. These must be a new initiative and a collaborative endeavour between developed and developing countries.

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ONE WORLD OR MANY: AMERICA'S ROLE IN MEDICAL EDUCATION

Tamas Fulop, M.D., Ph.D.

Introduction

It is a great honor and pleasure for me to have been invited to this Symposium on Medical Education and the Contemporary World, and to discuss the contribution that the USA has made to medical education in the world. I should like to thank all the organizers, and especially Professor George E. Miller, for the opportunity given to me.

The subject--medical education and the contemporary world--is actually an easy one but, at the same time, quite difficult. It is easy because in the past few decades the U.S. contribution has been enormous. Nevertheless, it is a complicated subject given its magnitude and some related controversy. Since I have been asked to discuss how the U.S. contribution to medical education in the world might be rendered more effective and efficient, I shall try to cope with both aspects of the problem--the achievements as well as the controversies--from a personal point of view and not as a WHO official.

The U.S. Contribution to Medical Education in the World

The U.S. contribution to medical education in the world has indeed been important. Discussing the initial impact of the Flexner report, Lippard (1974) wrote that "the year 1920 marked the beginning of a new era in medical education," after stating that "the level of medical education in North America was far below that in Europe." The U.S. contribution to medical education systems in other countries obviously started in the late 1920s and, in less than half a century, has reached the highest peaks. This contribution materialized first through institution building, both through capital investment and fellowships, helping to prepare individuals of other countries for teaching functions in the new institutions of their countries, and providing temporary teaching staff. Next, it appeared in the establishment abroad of American universities and, finally, in sending U.S. experts to help establish new training institutions. However, this enumeration need not be continued since these are all well-known and well-publicized facts. In my opinion, there is another aspect of the U.S. contribution which is not of material nature and is of much greater importance.

The post-Flexner renaissance of U.S. medical education has led to the establishment in this country of a network of research-oriented medical schools. As Glaser stated in 1971, "The single most important factor that has influenced the development of American medical education in the past 25 years has been the growth of research." Moreover, as Rall (1970) said when speaking about the scientific era in medicine, "The hallmark of this era is science and research, and its trademark is American." The strong and--after the second world war--ever-growing influence exerted by the United States on medical education throughout the world could be summed up by saying that the United States has set an example in combining emphasis on basic sciences with emphasis on down-to-earth clinical clerkship (Fulop 1972).

The new, postwar era in U.S. medical education started with the introduction of curriculum innovations, initiated by Dean Wearn, at Western Reserve Medical School. These developments led to soul-searching and scientific review of content and methods, and eventually to research vis-à-vis medical education.

A milestone in this development was the publication of the now classical book by Miller and associates (1961), after which nothing could remain the same in medical education. It was admitted that "teachers are not born," but can be "made," and that medical education also lends itself to close scientific scrutiny. Decisions in medical education are, therefore, to be based on scientific evidence, not on "educated guesses."

The "Miller book" was intended to be, and has become the world over, "a source book for those who want to know more about ways in which contemporary concepts of teaching and learning might be put to use in a medical school" (Miller 1961).

In the past three decades the ideas generated by U.S. medical education have exerted at least as strong a worldwide influence as have other more visible factors. The Western Reserve-type of "integrated curriculum," with or without multidisciplinary laboratories, can now be found as a well-accepted pattern in at least half of the more than 1,200 medical schools of the world. If we read carefully the series of case studies describing new, innovative medical schools in the 12 developing countries (Bowers 1970), we shall be hard-pressed to find any which do not refer in one way or another to the influence of U.S. medical education.

The idea that first took root in Buffalo in the early 1950s, namely, that teachers of medical schools should learn about and develop competencies in a systems approach to planning, implementing, and evaluation of educational programs, and how to carry out research in medical education, gave birth in the late 1960s to a comprehensive, long-term, sequential, and worldwide WHO teacher training program (Fulop 1969, 1972, 1973, 1974; World Health Organization 1974). The Center for Educational Development of the University of Illinois College of Medicine was designated as the WHO Interregional Teacher Training Center in 1970. From that time until 1974, 13 WHO fellows acquired a Master's degree in education and 58 of them received intensive 4-week training. The majority of these fellows are now serving as staff of WHO regional teacher-training centers. By mid-1976 eight of them could be found in five of the six WHO regions. The next phase of the program, involving the setting up of national teacher-training centers (NTTCs), started in 1975 and, it is hoped, will lead, by the end of this decade, to a situation whereby all countries wishing to have a NTTC will have one. In the last phase of the program, centers or units will be established as and where they are needed, at the level of individual institutions. Presently, enlargement of the scope of functions of these centers is being planned (World Health Organization 1976 unpublished).

The Center for Educational Development has also been serving as a WHO collaborating center during the past 7 years, and has prepared a considerable number of reports on teacher-training which have received worldwide distribution and have earned international recognition.

Comments on U.S. Contributions to Medical Education in the World

Speaking about the growing impact of U.S. medical education in the world, Bowers says that "unfortunately, it is the most expensive of the export systems of medical education, because of its emphasis on the teaching laboratory in the basic sciences and small group teaching at the bedside in the clinical years." He adds, "The most provocative and thoughtful new programs are coming from the developing countries" (Bowers 1970).

This argument is true. The exported U.S. pattern of medical education is not only expensive, but nowadays only a few countries can afford to pay for it out of their national budget. However, this may not be the most important aspect of the story.

Programs developed in the United States--really exciting innovations and initiatives--have been feverishly copied by many of the newly established institutions and by quite a few institutions already functioning, primarily in the developing world. The programs developed in the United States, presumably for U.S. needs, are evidently quite inappropriate for other settings where all the factors influencing the definition of a medical school program, such as socioeconomic conditions, epidemiological pattern, consumer expectations, organization of health services, and so on, are basically different. Those programs were, unfortunately, rarely adapted to local conditions.

Experts from the United States, as well as those from many other developed countries, and scientists of the highest level, full of goodwill but from a basically "paternalistic" approach, have tried to spread (and have done so with considerable success) the content and methods of U.S. medicine and medical education. They have tried to do so in all possible and impossible settings, often without much idea of, and sometimes even evidence of, concern for prevailing and decisive local conditions.

A similar situation has existed for foreign students who have come to the United States to study. They have learned, no doubt, the highest level medicine which, unfortunately, more often than not, is of limited use in their home settings. Not only the content and methods, but also the attitudes and value system learned, are generally incongruent with what is expected of them at home. The situation was the same for those who were trained in their own country but according to

U.S. norms and standards, following the Educational Council for Foreign Medical Graduates (ECFMG) requirements, and measuring success by passing those exams.

All these circumstances have undoubtedly contributed to the international migration of physicians, creating a situation whereby in 1971 a WHO study found 6 percent of the world's physicians (140,000 individuals) working in countries other than those of their origins, or in which they had become nationals and/or were trained. Of these 140,000, more than half (75,000) were working in the United States where, during the late 1960s and early 1970s, the average annual increase in the number of foreign physicians was about 4,000 (World Health Organization 1976 unpublished).

The phenomenon of international migration of physicians is multifactorial and its major cause is the overall international problem of unequal economic and social development. However, the inapplicability of foreign-made training programs is also an important factor, as portrayed by the famous example of a newly established medical school in a developing country of which the first graduating class left, in toto, for the United States. With the assistance of well-intentioned advisers, the program of that school had been designed similar to that of a famous medical school in the States.

Even the earlier mentioned and most successful teacher-training program is slowly becoming a threat in many countries. The danger lies in the fact that this program may and, in fact, often does provide teachers with modern jargon and equipment beneath which they sometimes try to conceal outmoded and even irrelevant content, methods, and approaches. Such behavior gives rise to criticism against the sound bases of the program and results in labels such as "American sophistication," or "another of those nondigested, nonadapted, exported American 'brain children.'"

New Needs in the World

If we look behind the well- or not always so well-founded criticisms, we shall find that there are new needs in the world of medical education, as in all other fields. Countries want to develop their own specific patterns of health services and adapt them to local community health needs and demands. Where services are scarce, they see them oriented principally towards primary health care. They want to develop for these health services health personnel prepared to cope with local health needs and demands, and not for some vaguely defined but certainly alien set of "international academic standards." Relevance is now becoming the key word--relevance to local community health needs and demands, in terms of medical education as well as all health personnel education. The new types of activities which are presently being developed to meet these needs are, for example, country health programming, the primary health care program, and the integrated development of health services and health manpower. The best ways in which the United States could use more effectively its vast resources to assist other countries would be through those that take into account new world needs as they have just been described.

Need for Collaboration

There is a need to collaborate with countries in a humble and sincere way, fully admitting that they know better what they need. All efforts to impose foreign patterns on them (even with the best intentions) and all paternalistic approaches can only cause harm, and should be abandoned. Hence, assistance should definitely be replaced by collaboration.

But collaborating in what? Collaboration is acutely needed in the following areas:

- Defining the objectives to be achieved and the actions needed to reach these objectives, inter alia, in the field of integrated development of health services and health manpower (of which medical education is but one element and not necessarily the most important one).
- Implementing and evaluating the above-mentioned activities, as well as collaborating in the development of necessary local managerial personnel or in the development of a capacity to create managerial personnel, and so on.

Let us cite, as one example, WHO's experience with country health programming (CHP). This work, as you know, is a process by which the country defines its health and health-related problems from an interdisciplinary view; sets priorities within these problems; defines objectives; develops strategies in the light of available and expected resources;

and translates such strategies into development programs, including resource requirements and implementation schedules.

WHO assistance to the first one or two countries was rather apart from the countries themselves. The WHO team of experts worked day and night with little participation by host country nationals. Although good programs were developed, the identification of the nationals, or at least of some of them, with the products was rather limited. Since then, WHO support to countries in their implementation of CHP has become limited in scope, essentially focusing on procedures and leaving substantive considerations and decisions to the nationals themselves. Moreover, discussions take place in the national language whenever doing so will facilitate the process. In this way, the results of the CHP process are truly national in nature and the recommendations of the national CHP group stand a real chance of acceptance by political and technical decisionmakers of a given country. The planning process then becomes an entirely national one, with a minimum of external input only when needed and requested by the nationals themselves. This type of collaboration is desirable from our point of view.

Accordingly, all activities are to be carried out *by* the people in the developing countries. Outside forces may only be invited to collaborate *with* them, but not to work *for* them, in developing exactly the things *they* need, and not what *others think* they need or, worse, *wish* they needed because it is intellectually so rewarding.

This on-the-spot collaboration must have a high degree of social relevance. It must contribute to improvement of the health status and quality of life of the people, not just to the satisfaction of intellectual curiosity of highly motivated professionals.

Such collaboration should result in locally developed, meaningful, and socially relevant programs, not in fragmented projects. These programs should be implemented now and with financial provisions that the country concerned can afford now.

Conclusion

Ours is one world, which belongs to the whole of humanity. We are all responsible for the future of this world, and we health professionals, for the health of future generations. None of the professions or countries around the globe can sacrifice or endanger this future for egotistic reasons. We all must share with one another what we know, and we need to be humble enough to learn from others what they know better than we do. We all have to collaborate with one another in identifying quantitative and qualitative local health needs, and then in attacking and solving local priority health problems. This task should always take place in our own countries, and be carried out with our own forces. The collaboration and contribution of others, however, should always be most welcome. After all, the success will not only be our reward, but will benefit the whole of humanity, as well as our descendants.

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ONE WORLD OR MANY: AMERICA'S ROLE IN INTERNATIONAL MEDICAL EDUCATION

Critique and Challenge

George E. Miller, M.D.
Discussion Initiator

Dr. George E. Miller: We have heard three informative and provocative papers which certainly highlight for all of us the formidable problems faced by the developing world. They should also arouse in us a sense of humility, and recognition that our solutions may not be the solutions that are required if we are to fulfill our historic role of assisting other countries in achieving their own full potential.

Let me begin by asking each of the panel a question stimulated by their uniform comment that what we teach those who come to us from other countries, or what we export to other countries, is often irrelevant and rarely designed to meet the needs of those nations. If that is the case, it suggests that we have not been either sensitive to or prepared to learn about those needs before we try to provide solutions. Are you telling us that as medical educators, we are myopic about what we are doing when we go to other countries?

Dr. V. Ramalingaswami: Let me make my position clear. I do not suggest that what you teach is irrevelant in any broad sense for, after all, if a physician from a developing country comes to you asking to be trained in cardiology or cardiac surgery, you surely do not have two different ways of training a cardiac surgeon, one for a developing and another for a developed country. But you can at least identify some of the limitations a cardiac surgeon will encounter in a developing country and help the physician find ways to adjust to the difficulties and problems that lie ahead. Basically, then, the training for a highly specialized discipline will be the same whatever the nationality of the trainee. I doubt there is very much you *can* do to make the physician serve a given country in a more relevant manner. The solution to that problem lies elsewhere, not in the universities here. The real problem is what the person comes here to be trained for. But it is important for you always to ask what are the feelings and the sensitivities that are important in their own countries if the cardiac surgeons are to have impact upon the care of people there.

Dr. Tamas Fulop: I would say that your educators know quite well what they want to do. They want to spread American experience, American medicine, and the ideas of American education because they are convinced that it represents the best, which they want to share with others. But you also asked whether they are sensitive to the needs of others and prepared to learn before they teach. And I would venture to say not very much. However, we must in all fairness add that this attitude is changing. What we have described was mainly the past contribution of American medical educators. We must be appreciative of the fact that in recent years new attitudes appear to be taking hold. I must note that these observations do not apply to American experts alone, but also to those who come from virtually any developed country. And I echo the comment of Dr. Ramalingaswami that if you train a cardiac surgeon in the United States for a developing country, he or she should be the same product as one trained for America. But it is not at all clear that developing countries most need cardiac surgeons and other highly trained specialists who emerge from many U.S. programs at this time. Because such people are not the answers to the primary needs of these countries, the result is that they may never go back, or if they return, they may be so frustrated that they leave for the United States or another developed country.

Dr. Miller: Both of you seem to be saying that we do very well what we know how to do but perhaps what we know how to do is not what the rest of the world needs.

Dr. John H. Bryant: That may be so but to ask the question in such a general way tends to obscure some of the differences in objectives that the people of other countries and we in the United States might have in working with one another. For example, many basic techniques or applied methods or clinical skills are independent of setting. They can be learned here and transplanted readily. However, if what is to be learned is culture dependent, or is influenced by local resources or a local setting or a local system that we may not understand and for which we have no relevant model here, then we cannot teach about it. Indeed, if we try, we are likely to be misleading and may even by our efforts socialize students away from interest in returning to their own countries. We must face the question of what we do about all this. In my own school we have many applications from foreign nationals. We give preference to an individual sponsored by his or her own country or by an international agency, and if there is some clearly defined plan to return to the homeland.

Dr. Miller: Let me turn to your suggestion, Dr. Bryant, that we need to help other countries explore new ways of organizing medical education in a way that is more likely to produce the physicians that will meet national needs. Among other things, you suggested eliminating university hospitals and departmental organization and placing education in community settings. What I hear you asking us to help other countries to do we seem unable to do for ourselves. How then can we help others?

Dr. Bryant: The fact that we have not accomplished it here does not mean that we should avoid participating in attempts to do it elsewhere, as long as we are properly humble in doing so. For example, the suggestions I have made may be entirely wrong. If I were involved in such a program with colleagues in another land, we would begin with a preliminary assessment of possible directions in which solutions might be found. It is predictable that any proposals would at best turn out to be only partially correct.

Dr. Fulop: I am afraid that Dr. Bryant's suggestion again carries the implication that we try to arrive in a foreign land with a bag full of solutions. I have sensed this danger in the whole approach you have taken in your talk. This may have been an acceptable approach 10 or 15 years ago when they really had no experts of their own. Now there is no developing country in the world without a group of people who know better than any outside person what their needs are. And they resent people who arrive with set solutions. For this reason, I would not go with any such solutions as elimination of university hospitals or departments or anything else. Outsiders must go there openminded, prepared to listen, and ready to seek solutions with host nationals. Let me add that I think the United States is doing remarkably well in training doctors for its own needs. The fact that forward-looking people feel these may not be the needs of the coming decade (a view I would share) is another question. Certainly American schools are producing the type of people that can fit the needs of the moment, as are Canadian medical schools. But this is not what is needed in other countries.

Dr. Miller: If I may draw an inference from what both you and Dr. Bryant have said, for I think he simply used the specifics as illustrations of possible things worthy of exploration, you suggest that if we are really to be collaborators with developing nations, we must go not with answers but with a spirit of inquiry so that together we may learn. Is that what you want us to take when we are educators in other countries?

Dr. Ramalingaswami: Yes, precisely so. The approach should be one of joint endeavor, an experimental approach, an approach that will use modern history and modern technology to suit the local environment. I want to give one example from the field of health technology. You do need a fairly refined health technology to establish the simple fact that a patient with cholera or a child with dehydration from diarrhea can, within limits, be brought back to normal through the use of electrolyte mixtures made by a paramedic or by the mother. Now this is a finding of tremendous public health importance, that in the huts and homes you can treat children with diarrhea or detect the ones who need institutionalization. Now to come to this stage required first the appreciation of the importance of the problem. Many people look for solutions but it is really more important to identify the questions and then to use carefully controlled laboratory measurements to prove the kind of hypothesis you are working on. This requires not only high technology, but also adaptation of that technology to rural environments. Let me give another example. There are few things more important in the developing world than taking immunization services into the rural areas where one has no facilities for refrigeration to keep immunizing agents potent. Now what can technology do to solve this problem? Such questions growing from simple situations cry for solutions by the application of high technology. This area, both in education and in research, requires a joint endeavor, an experimental posture, and constant probing.

Dr. Miller: I hear you saying that when we engage in this work we should go abroad as the scientists we claim to be rather than as the missionaries we often appear to be.

Dr. Bryant: I would like to come back to Dr. Fulop's point about the nature of colleagueship when we are involved with developing countries in such enterprises. I believe we should arrive with open minds, but not with empty minds. We need to be realistic about what this collegiality is: We will face health problems and face them together. We should be willing to state our positions as long as we forego insisting on having our way.

ONE WORLD OR MANY: AMERICA'S ROLE IN INTERNATIONAL MEDICAL EDUCATION

General Discussion

Participant: Dr. Bryant has indicated that his school selects certain students and rejects others assuming this will be good for the countries from which these students have come. Let me turn it around another way, for what Dr. Fulop has been stating might suggest an alternative approach. If we agree that the United States might have some skills or fund of knowledge or technology which is usable elsewhere, then perhaps the countries themselves should identify the subject in which training is needed; select the candidates for such training; select the institutions in the United States best suited to provide such training; be prepared to pay for such training; and possibly prohibit others of their citizens from leaving the country to get training. Now this is a most serious set of circumstances, but I wonder if some of your comments do not lead us to this type of conclusion.

Dr. John H. Bryant: Why are you troubled?

Participant: I am troubled because it would determine how we respond to applicants from all over the world. It would be much easier for us to say to applicants that since your country has not sent you, has not identified the reasons for which you are sent, we cannot take you. This does interfere with one form of international relationships and perhaps this interference would, in the long run, be bad. I can understand that developing countries must preserve precious manpower resources but the methods which seem to be required have important implications in terms of how our educational institutions must respond to applicants.

Dr. V. Ramalingaswami: I go along with these comments right up to the last point. I think the time has come when each country must decide what kind and what levels of competence in the health field it wants to have now and in the future. This is, of course, more easily said than done, but it is step number one. It is an exercise in health manpower planning that each country must carry out for itself either alone or with the help of international agencies. That country must then express to the United States, or to any other country, that these are the people and the numbers that they want to have trained; these are the specialties they wish them to learn. This is absolutely essential. And to the extent it is able to do so, there is nothing more noble than the country itself sponsoring and paying for the service it wants to have. Where its financial resources are inadequate, the help of international organizations and other national governments could be taken. Up to this point all is very well, but then there is the question of whether all these conditions must be fulfilled for this kind of network to really function. Do you stop others who want to come to the United States to be trained? Now this is something on which my country has been quite vocal. At one time the Government of India said that no medical graduate could leave the country until 7 years after graduation. The day after that law was promulgated, there was an appeal to the Supreme Court which finally ruled that the Constitution of India holds education as a fundamental right of every individual who can go anywhere on this planet to seek it. I think we must seek other ways, including highlighting, both to our own medical graduates and to those of other nations which may offer them postgraduate training, what our greatest needs are, even though at the moment there might not be enough government positions to guarantee that the person could be offered a place in the health service system. We must emphasize both the need and the expectation that in the course of time government or the economic ability of people will be able to sustain and pay for the services of these persons. In this way the whole structure will not become terribly distorted and training will still have relevance to the pattern of manpower that the country has set for itself. I would think such an intermediate position would be better than saying we just will not let anybody leave a particular country.

Participant: I would like to ask the panel to speculate on the effect on foreign trained graduates of the prediction that American graduates will soon exceed the number of positions available for their first year of postgraduate training.

Dr. Ramalingaswami: I welcome the increased output of physicians from within the United States to man the positions that are available here.

Dr. George E. Miller: I think that position would be endorsed by virtually every developing nation.

Participant: Having spent about 6 years in a university assistance program in a developing country, I can hardly disagree with many of the criticisms about such programs that have been voiced by our panelists. It would seem to me, however, that we have to get the medical school faculty members in these developing countries to come to the same conclusions that our panelists have reached, not merely the deans, government officials, and people who sponsor 2- or 3-day workshops, for it is the faculty which serve as the role models for students. This is difficult to do and requires an enormous amount of time but is one of the great deficiencies in many of these programs. How do you establish in a faculty the capacity for change, for exploring new alternatives? How do we get teachers away from the kind of dogmatic and authoritarian and passive style of teaching and learning that is now so widespread?

Dr. Ramalingaswami: I agree entirely that a basic change must come within faculties. One step I would suggest is a greater engagement between the faculty and the health care delivery system.

Dr. Fulop: I think that this may be the most important answer to the question. In fact, it has been accepted now by the 150 member nations of the World Health Organization to try to promote, both at national and subnational levels, mechanisms to bring together all those directly concerned with health services and manpower development, as well as other sectors which are interested in this field. I think this action may bring the necessary pressure on schools to develop what is needed.

Participant: I was part of one of these rather poorly conceived and perhaps paternalistic programs in another country, and I am sure I made all the mistakes that have been described. But, despite the shortcomings, there was exposure of visiting faculty to cultural differences, to educational differences, and to new problems which seemed a very, very positive thing. Have not many of these programs, some ill-conceived, some of them far too enveloping, had this effect? And had we not more widespread interest in such work a few years ago than we have now? If we have reached a place where only a core of highly trained international experts can be helpful, then should the questions the panel has raised be addressed to this group or should they be addressed to the political forum where the support issue will be settled? It seems that we can only give dollars; we cannot give ourselves because our efforts have been so imperfect in the past.

Dr. Fulop: I think that all three talks have paid tribute to the efforts that the United States has made. It may sound paradoxical but the fact that the developing countries are now dissatisfied is largely due to the contribution that U.S. medicine and medical education have made in developing a cadre of bright young, and maybe not so young, people who are now able to recognize that what they have received was not relevant. In short, they learned how to think. They learned to a very high degree, not only medicine, but responsibility to their own nations. The fact that they are able to question the relevance of more of the same thing is not to condemn what has been done so far. They pay tribute to what they have learned by recognizing that changes are needed because circumstances have changed. What is now needed is another type of collaboration.

5. THE ARTFUL COMPROMISE: A SUMMING UP*

E. D. Pellegrino, M.D.

> "A very popular error--having the courage of one's convictions: rather it is a matter of having the courage for an attack on one's convictions." --Nietzsche*

Introduction

No commentary, least of all mine, can do justice to the 14 excellent papers we have heard so expertly delivered in the last 2 days. Only the high quality of the discourse and the serious intent of this conference can mitigate my sense of foolhardiness at undertaking such a difficult assignment.

I have been asked to provide an "artful" compromise--one which might identify patterns of agreement and suggest modes of accommodation where agreement is lacking. In the themes our speakers have offered us, I do detect large areas of near-agreement susceptible to compromise. But I also detect a fundamental divergence in opinion on what should constitute the fundamental ordering principle in medical education. This divergence, I fear, is not to be eliminated by compromise, however artfully constructed.

With your indulgence, then, I would like to concentrate rather more heavily on artful confrontation than compromise. Two different root principles have been offered to us as the organizing element in medical education: medicine as science and medicine as community service. While each acknowledges the existence of the other, the matters of student selection, program content, and cost are shaped very differently depending upon which principle predominates. Interestingly, it is the internationalization of the American educational ideal which most clearly exposes the dichotomy of its organizing principles.

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*Quoted in: W. H. Auden and Lewis Kronenberger. 1962. The Viking Book of Aphorisms. Viking: New York.

The central issue for medical education in the remaining years of this century is the degree to which the opposing thematic systems can coexist--without capitulation of one to the other. This issue is more than a question designed to titillate the scholastic mind. Increasingly, public opinion is opting for community and social need as the organizing force. With equal vigor, the academic sector is opting for the scientific and technological character of medicine.

Much depends on how fundamental we construe the differences to be. If we follow the dominant educational pattern of medicine as science and technology, then all that is required is "fine tuning" to bring the instrument of medical education into harmony with what society needs. If, instead, we adhere to the values of a community-oriented educational instrument, then drastic measures are demanded to counter the growing dissonance between medicine and society.

No instrument of society can endure unscathed when its purposes become radically dislocated from those society requires of it. In America, and in the remainder of the world where American medical educational ideals are so closely emulated, there is the real threat of two parallel systems of education and practice based on each of the divergent ordering principles. Were this to eventuate, both society and the medical establishment would be the losers.

To advance my thesis, I shall proceed in the following way: First, I wish to examine the nature of compromise and dialectical confrontation in the context of the nature of current discourse on medical education. Then, I shall illustrate the nature of the two ordering principles and the different ways they shape the four questions before us. I shall then seek the most practical points of convergence between the two thematic systems. Finally, I shall outline the elements of a reasoned discourse between the opposing principles.

Nature of the Discourse: "Artful" Compromise or Confrontation

With his usual prescience, George Miller assigned the title of "artful" compromise to this closing commentary. I am impelled, therefore, to clarify the sense in which I shall use this term.

"Compromise" may be taken in two senses. In one sense, it refers to the process of accommodation of rival viewpoints by mutual concessions, and a yielding of something by each side to the other. But "compromise" can also refer to weakening or imperiling a position and exposing it to risk. An "artful" compromise, presumably, is one which skillfully and diplomatically achieves an accommodation of opposing views with a minimum of peril to the principles upon which they stand.

Compromise in the constructive sense can occur under certain specific conditions: when the ideas or positions are simple contraries, that is, they differ but involve no logical incompatibility; when the ordering principles from which they derive differ only in emphases or interpretation. Compromise is possible, in short, if the underlying presuppositions do not differ in essence.

But compromise takes on a destructive sense when the opposing viewpoints involve some logical incompatibility and when the ordering principles differ in essence. Under these circumstances, the opposing viewpoints are really in dialectical confrontation. Compromise would imperil one or the other. Resolution is possible only by some new welding together of antithetical ideas which retain their essential differences, but assume a new and complementary relationship to each other.

Artful compromise, therefore, would do justice to neither position, and would, in fact, merely submerge issues of fundamental importance. In place of the popular version of a dialogue--a term, by the way, sadly misshapen from its original Socratic meaning--we should substitute the kind of conceptual confrontation required in true dialectical reasoning. The process should be dialectical in both the Aristotelian and modern sense of that term.

In The Topics, Aristotle proposed dialectical reasoning as the mode suitable to dealing with opposing opinions not based on scientifically verifiable propositions. This he contrasted to demonstrative reasoning, which starts from scientifically valid propositions and ends in truth rather than opinion. Aristotle argued that dialectical reasoning, while inferior to demonstrative, was nevertheless useful. It clarifies contradictory opinions, examines and exposes their relative merits, allows for examination of its consequences, and pinpoints residual differences susceptible to compromise. It can clear the ground for demonstrative reasoning when verifiable statements become available.

Dialectical reasoning in the more modern sense is associated with Hegel and Fichte. Here again, a mechanism is offered to deal with contradictory notions. Recognition is afforded of their logical incompatibility. Without nullifying the differences completely, we can mitigate one sidedness of each position in the synthesis of a new concept which may itself be subject to contradiction. But the recurring cycle of reconciliation through synthesis provides a dynamic rather than a static confrontation of opposing ideas, moving us gradually a little closer to truth.

What both the classical and modern notions of dialectic guarantees is that each of the opposing viewpoints takes the other seriously. Even ideological discourse can profit from a dialectic of high quality, while without it, there is no alternative to thought- and action-paralyzing stalemate. In its absence, a false sense of amity ensues which obliterates serious differences; each side merely ignores the assertion of the other, and sermonizing substitutes for serious intellectual encounter. This, sadly, is the spirit of much of our national discourse on medical education, politics, and international affairs. It is especially evident in the secular insipidity of our TV opinion panels and "debates." Rational discourse gives way to psychologistics, and we never experience the careful dissection of assertion and counterassertion.

The distinctions between the process of compromise and dialectical confrontation are not trivial, nor are they an invitation to sophistry. Their purpose is not to enable one side or the other to "win" an argument, but to deal sensibly and responsibly with conclusions based on initial propositions which are only probably, and not scientifically, certain. That the presuppositions upon which any theory of medical education is founded are largely unproven--and possibly unprovable--is all too apparent.

Compromise and Ideologic Discourse

Let us turn now to the papers we have heard. To what extent is artful compromise in the constructive sense applicable, and to what extent is a dialectical discourse required? In my view, the papers exhibit two opposing value sets, each deriving from opposing presuppositions and each struggling to take precedence in shaping medical education. These differences are only in small part subject to compromise. For the greater part, the creative tension of a dialectical encounter is required if we are to deal constructively with these antithetical propositions.

The papers by Ebert, Schulman, and Chase state, most forcefully and most eloquently, the case for medical science as the ordering principle. With some modifications in the matter of evaluation or curriculum, these three authors assume that it is in the best interests of society to shape future physicians pretty much as we do today. On the other side, Bryant, Fulop, and Ramalingaswami underscore the growing discontinuity between the kind of physicians produced by the dominant value system of Western medical education and the needs of contemporary society. While their disquietude is enunciated in the name of the developing countries, it reflects just as eloquently the concerns of many in our own country where scientific and technological medicine are readily available.

Splaingard and Bergen in their analyses of who shall pay, and for what, generally assume that the product is a physician educated in the present mold. Bulger, properly recognizing that the problem of costs is a second order problem entirely dependent upon what it is the system wishes to produce, nonetheless takes no serious issue with the dominant pattern.

Interestingly, Henry and particularly Corbally as the only consumers partaking in the discussion--and highly sophisticated consumers they are--raise serious questions about the congruence between what medical educators deem to be in the public interest and what the public deems to be in its interest. Corbally confronts the issues squarely when he says, "Our national problem is not what we can afford, but what we want to support. Our problem as educators is to determine, with the people, what kinds of medical care they want, and to determine the best ways to prepare personnel to provide that care." He called the educators' attention to the questions of availability and quality of medical care as antecedent to any concern for costs.

The three papers on selection subscribe, in varying degrees, to the dominant patterns of education. They express some concern for the dehumanization of medicine, the technocentric bias of the modern physician, and the inadequacy of the GPA and MCAT. Marston is justifiably concerned with the matters of equity and justice in selection, but feels no drastic changes are indicated. Gellhorn and Grove are most sensitive to the need to develop physicians with genuine humanistic and humanitarian sensitivities; they would alter the selection process to include more students who show evidences of empathy and interest in people. While suggesting changes in the curriculum to encourage a more humanistic attitude, even these papers accept the "omnipotential" scientific physician as the goal of medical education.

The papers are paradigmatic not only of the two opposing value systems in medical education, but they also illustrate the nature of the discourse as it takes place in most countries today. The two fundamentally divergent viewpoints are usually expressed in the form of a friendly and tolerant dialogue. Each is propounded clearly enough, but without the intent of serious engagement of the opposing view. Our dedication to an easy pluralism and our disinclination to conceptual confrontations ensure that diametrically opposed concepts will courteously bypass each other. They are respectfully heard, and as respectfully ignored or discarded, without critical examination. We have lost our taste and our capacity for a genuine and creative confrontation of opposing concepts.

What results is ideological discourse rather than dialectic. I am using ideology in Karl Manheim's (1960) meaning to designate convictions that have become so bound to the interest of a particular group that they are oblivious to contravening fact or opinion, even when the contravening notions reveal real conditions in society. Ideological stances use ideas as weapons in support of value presuppositions rather than as objects for critical examination. Ideological statements simply refuse to take opposing views seriously enough to enter into intellectual confrontation with them.

Compromise, in the constructive sense in which I have defined it above, is possible between differing viewpoints within the same ideological system. Thus, the differences between Grove, Gellhorn, and Marston are resolvable by compromise, as are they between the positions of Ebert, Schulman, and Chase. Compromise between ideological systems is dangerous and usually inauthentic. Thus, compromise between the first six papers and the three by Bryant, Fulop, and Ramalingaswami would be illusory, potentially destructive to both, and oblivious to what are important essential differences.

Value Systems in Opposition

We should turn now to a more precise characterization of the opposing value systems which these papers illustrate, and the way those values impinge on the questions before us--student selection, curricular design, cost of education, and exportability of the American medical educational system.

The dominant value system in American medical education holds that modern medicine is essentially an enterprise of science and technology. The physician is the guardian of this arcane knowledge and the mediator between its sources and the needs of patient and society. In virtue of that guardianship, he is best qualified to define what medicine is, what needs of society it shall address, in what order, and by what means. The mission of medicine is to heal and eradicate serious illness, largely of the acute and organic variety. Medicine best serves society by solidifying its scientific base and not dissipating its energies in attempts to heal the social ills which admittedly contribute to disease, but which are not matters susceptible to medical solution.

Concepts like "community," "health," and "social medicine" are at present too vague to detain the physician whose efforts must be to eradicate serious illness. To the extent that he can emulate the method of science, the physician will become a good clinician. The rest is art or intuition and not susceptible to analysis or serious intellectual inquiry. Objectivity, detachment, and competence are to be inculcated to counter the constant pull to "fuzzy" thinking and empiricism which so easily beset the practitioner.

From this view, primary care, community medicine, and family medicine are not disciplines with a content of their own, but derivatives of the specialties. They are best served by physicians educated in selected portions of the specialties, particularly since it is of utmost importance not to miss a significant organic disorder which may present itself as a common symptom.

The impact of this value system on medical education has been profound. It is best expressed in the Flexnerian doxology: Medicine is a university discipline, medicine is a scientific endeavor, competence means specialization, teaching must be by full-time academic physicians, and the proper training ground is the hospital owned and controlled by the university. Student selection, in consequence, emphasizes scientific preparation and quantitative abilities. While humanities and social sciences are useful, they are not primary or central. The high cost of medical education is justifiable because scientific medicine demands a highly specialized faculty, teaching on a one-to-one basis, and depends on availability of the latest in equipment and research facilities. So far as exportation to developing countries goes, America should make available what it does best--scientific medicine.

The benefits which flow from science as the ordering principle in medical education were concisely adumbrated in Mr. Snider's commentary. As a science writer his assessment of what scientific medicine means to the public is particularly important. These are the values which all the medical educators we have heard would preserve, though with varying degrees of emphasis and some modifications in the way they are transmitted to students. While admitting certain deficiencies such as the need for a more humanistic strain and more emphasis on problemsolving, everything is to be accomplished in the frame of medicine as a discipline of science, and every student is to be inculcated with that spirit.

A quite contrary, and sometimes contradictory, set of values is propounded in the papers by Fulop, Bryant, and Ramalingaswami. Their ordering principles are the community and society. Medicine in this view is primarily an instrument of social purpose, designed specifically to alleviate the major health needs of a country rather than just its medical needs. Medicine should, in consequence, be shaped by the epidemiology and ecology of illness of the country it serves. The social, economic, demographic, and cultural sources of ill health are as much a concern as the curable organic disorders. Primary care, community medicine, prevention, and family medicine, therefore, have a higher priority than highly specialized tertiary care. Advanced technologic medicine is assigned an important but limited place, since it benefits only a few. Only if it has wide community benefit is it to be cultivated. The decision on how to use medical knowledge, for what purposes, and how resources should be allocated are public, not professional, decisions. The health care and the educational systems must be planned and operated together.

Both affluent and developing countries have large sectors of health care largely outside the value systems of the medical profession. In the affluent countries, as Marc Lalonde (April 1974) has so well pointed out, it is alcoholism and drugs, automobile accidents, lack of exercise, overnutrition, occupational and environmental hazards, and emotional disorders that take the largest health toll. In underdeveloped countries, poverty, malnutrition, population control, immunization, sanitation, diarrheal disorders, and neonatal mortality are the central social needs. But whether the country is affluent or poor, industrialized or not, the centrality of community need rather than medical science is the point of departure for medical education.

Those who hold community need to be the ordering principle have labeled contemporary medical education as "irrelevant" and "socially dysfunctional." They condemn the preparation of a homogeneous physician who is inadequately prepared for the heterogeneity of the tasks society requires. In this view, it is not the biological sciences which should prepare the physician, but the social and behavioral sciences and the humanities.

The impact of community as an ordering principle for medical education is easily apparent. Selection would concentrate on students with deep social concern, an interest in the mundane but common health problems. The pertinent attitudes of mind are those engendered by economics, anthropology, political sciences, and epidemiology rather than the biological and physical sciences. Quantitative ability is largely of the statistical kind.

The curriculum similarly would emphasize the kind of decisionmaking capabilities needed in primary and family medicine and prevention. This approach is different from coming to final closure on diagnosis and treatment in a complicated case. The cost of education would derive from the need to provide learning in all kinds of communities, exposure to practitioners, and training in the nonlaboratory disciplines. Science would not be the energizing spirit; practitioner-teachers would play as much a role as full-time academicians; education would take place not in the university hospital but in the community.

To accept community need rather than medical science as the leitmotiv of medical education would, as Bryant and Ramalingaswami maintain, require drastic changes in the configuration of medical education. Almost all of the Flexnerian dicta would be contravened or "compromised" in the negative sense of the term. We would end up with a very different distribution of health care personnel, for example. Instead of increasing the number of physicians and expecting them to assume roles in primary care and prevention, these functions would be assigned to nurse practitioners or some group equivalently trained. We would need fewer physicians, highly technically trained, to cover smaller portions of the spectrum of medical and health needs.

These characterizations are admittedly more sharply drawn than adherents of either view might wish. I have done this purposefully to display the practical consequences which flow from each organizing principle. It makes a distinct difference which principle we start from in answering the questions set before us in this symposium. Each principle generates its own uncompromisable determinants whenever priorities are to be established or resources allocated. Each provides a different attitudinal framework out of which physicians form an image of their role in society. That image then becomes the justification for what physicians, in fact, do, rather than what they might do in society.

The tension between the two ordering systems is more than academic or polemic. It is evident in the growing movement by external agencies to gain control over the educational and even the accreditation process. A series of health manpower bills have been drafted attempting to increase the output of general physicians, limit the number of specialists, and effect a better distribution of both. Equally indicative, though more indirectly so, are the successive pieces of legislation on health care planning and quality control, as well as a widespread public interest in a patient's bill of rights, the complex issues of biomedical ethics, and the growing plea for more "humanism" in medicine. Most recently, the public disquietude has extended to such previously closed precincts as the degree to which technology should be extended and the potential social hazards of unrestrained research (in microbial genetics, for example).

The public already perceives the tension between the two value-laden principles of science and community. What it perceives also is that these opposing systems justify themselves mainly by internal reference, using one derived value to justify another, but never really establishing the first-order validity of their organizing principle. Least of all is there evidence of the radical contact of each ordering principle with the other which could convince society of the willingness of their proponents to forego internal justifications.

Not altogether wisely, perhaps, public opinion seems to be gravitating away from the scientific image and toward community interest as the more pertinent principle. If the proper balance between these value systems is to be struck, we need more than dogmatic assertions and ideological claims. We need a more discriminating analysis of what is compromisable and what is not between these systems. Most of all, we need a clearer explication of the reasons or the evidence which supports the organizing principles themselves.

Some Points of Convergence, Divergence, and Compromise

We lack time for the kind of critical analysis of the organizing principles of medical education required to regain public confidence. A brief survey of some points in the papers we have heard may reveal some of the most critical sites for engagement.

Who Should Be Selected?

The three speakers on this topic agree on a major problem--the difficulty of making rational and just choices among an ever-larger number of qualified applicants with small differences of capabilities among them. They agree, too, on the need for additional noncognitive criteria, particularly those indicative of "empathy" and "humanism." They differ somewhat in their approach to a solution. Grove clearly opts for a process of modified randomization from a preselected sample; Gellhorn decries the emphasis on science and offers a method for weighing affective qualities; and Marston focuses on the problem of justice, but concludes that no drastic change in present selection methods is required.

The problem promises to become more acute in the future. Students will be even better qualified, legal and ethical challenges will limit the use of subjective criteria like the interview, and pressures will increase for selection of more "humanistic" students. Some modified form of randomization from a pool predetermined by a wider variety of criteria than we now use seems a likely point of compromise.

The interview is the faculty's way of expressing its value system, and it will be difficult to eliminate entirely. As a compromise, it will probably be used selectively. Interviews might still be useful in assuring that patient- and service-oriented attitudes can receive proper weighting in selection. But, they will be applied to limited samples of the applicant pool--probably at the extremes of the distribution curve of academic performance, and not in the middle.

Agreement is yet to be reached on the meaning of the term "humanism." As I have indicated elsewhere (Pellegrino March 1974), humanism embraces a wide range of affective and cognitive skills, from humanistic psychology, on the one hand, to the humanities as traditionally understood, on the other. By and large, our speakers seem to mean empathy, feeling for others, sensitivity to human problems in illness, and the capacity to identify with the patient's situation.

Several pitfalls and illusions must be avoided in attempting to assess such qualities in applicants: 1) Taking courses in the social sciences or humanities cannot guarantee humanistic attitudes. 2) Students with poorer academic attainments are not by that fact more humanistic. 3) The methodology of assessing attitudes is still rudimentary. 4) There is the danger that eager and resourceful applicants will conform to the new attitudinal scales as they now do to criteria of GPA and MCAT. The result could be a depressing psychological conformity just as debilitating as the current cognitive conformity.

Perhaps the more relevant issue is the process of self-selection, the point at which a student first chooses to undergo the rigors of a premedical education. Some students exclude themselves from this competitive milieu from the outset, while others plunge eagerly into it. What makes the difference? Is it the pull of a lifestyle, power, prestige, independence, authority, and intellectual challenges? All of these possibilities radiate powerfully from the dominant image of the physician in today's society.

The mix of students entering medicine will change materially only when the image of the physician in society changes. If we were to acknowledge that several different kinds of physicians are needed, that each requires different kinds of aptitudes, and that selection for each type will be based on different criteria, then many who now reject medicine might well enter it. Admission criteria are simply obstacles to be overcome to those sufficiently motivated to become like the dominant image of the physician. It is the image which attracts or repels certain kinds of people. Students with more "humanistic" values will be attracted if the image becomes more "humanistic."

Selection illustrates the kinds of confrontation of organizing principles I have underscored throughout this essay.

Those who follow the scientific principle--as our speakers on this question do--conclude that the physician must be trained for all current medical tasks, including primary care, prevention, social medicine, and whatever else society includes under medicine. No matter what tasks are to be performed, the physician must first be trained scientifically and without much variation. Every student must conform to the scientific premedical pattern to survive the first 2 years of medical school, regardless of how distant the ultimate role in society may be from a scientific endeavor.

If we take the community to be the organizing principle, we get a different outcome. Here, we turn our attention to the more ordinary problems of medical care, primary care, and prevention. We ask whether physicians need to fulfill these needs, or whether the nurse practitioner or physicians assistant may not be better equipped to do so, and more economically. We may see the physician becoming a more technical specialist and the nurse practitioner assuming most of the functions of primary care. The number of physicians needed may then be much fewer, while the need for nurse practitioners may be considerably greater than is now the case.

If this latter were the prevalent view, medical schools would attract a different type of student. Interest and capability in laboratory science would be less pertinent than interest in ecology, epidemiology, sociology, and behavior. Capacity to work with others as peers becomes more important, as would skills in negotiation, persuasion, and group leadership rather than authority. Capacity to deal with ambivalent rather than factual questions and satisfaction with long-term rather than immediate results would evidently be the more suitable skills.

There is no easy or artful compromise between the intellectual and personal capabilities demanded by the two ordering principles which will not ultimately sacrifice one to the other. Different students will wish to conform to each pattern. Society needs both. The confrontation of these differences, and the refusal to yield to an illusory compromise, is essential to a viable relationship between them which will benefit students and society.

For example, without suggesting that this is the only resolution, medical schools could take cognizance of the value of each organizing principle. One might adjust student selection to the actual needs of society for different kinds of physicians. Eighty percent of the entering class would then be chosen on the basis of capabilities and interests suitable to primary care, prevention, occupational medicine, and the like. Twenty percent would be selected on the strength of their scientific capabilities and education for the clinical specialties and the biomedical sciences.

If we were to relate the opposing principles together in this way, the energetic debates over the merits of organic chemistry, biology, physics, and mathematics, on the one hand, and literature, philosophy, and the social sciences, on the other, should cease. Each set of disciplines would be given its due provided we do not expect every student to master all of them. We would have to abandon our pursuit of the will-o'-the-wisp of the complete physician, the "omnipotential blast cell" referred to by our speakers. We would obviate some of the patent difficulties of assessing humanistic qualities. Self-selection for each of these major types of physician would do much of the job for us.

In like manner, the dominant philosophic stance of medical education--its overwhelming commitment to positivism, reductionism, and pragmatism--would be counterbalanced. The future intellectual history of the profession would, in turn, be modified and broadened considerably. The greatest advantage would be in a more mature education--one which more closely matched student interest and capabilities to the kinds of tasks society requires, rather than forcing all students to conform to one intellectual type.

There is no question here of one principle or the other triumphing. Both would be retained and would be identifiable in their differences--and indeed cultivated for those differences. We would avoid the illusionary pseudopeacemaking of a C.P. Snow, who compromises both science and the humanities in his search for amity. Disciplines are like individuals; they work best together when they know their own identities and make their differences their contribution.

What Should Be Taught?

The three papers in this section of the symposium are at the center of the dilemma we are considering, the center from which the problems of selection and cost finally emanate. Whom we select depends heavily on what we expect to teach, and our courses of study should depend upon what we intend the physician to do in society upon graduation. Cost, while vexing, is only the means; it will be acceptable or not depending on how well we manage the enterprise and how well we articulate education with service.

The curriculum is more important for the values it reflects than for the precise methodology it employs. The tenacity with which the current curriculum is defended is in part due to its success, and in part due to the commitments of faculties to the values it embodies. Such commitment is evident in the essential agreement among the papers by Ebert, Schulman, and Chase. They exhibit a philosophy of medical education firmly rooted in the biological sciences. They see little need for change in the time allotted; they accept also the idea of limited tracking, a little more flexibility in electives, and a reaffirmation of the omnipotent physician as the end product.

Within their close philosophic agreement, there are some differences in emphasis on which "fine tuning" should concentrate. Chase deplores the lack of alternatives in learning methods and wants evaluation more precisely attuned to competency. Schulman is worried about the quality of some of the graduates in some of our schools and the defects showing up in the innovative curricula. Ebert wants more emphasis on problemsolving of a special kind and a clearer definition of the content of family medicine. The issues they raise are easily resolvable within the educational philosophy the speakers had in common. "Artful" compromise would be attainable without challenge to the scientific organizing principle of medical education.

There is one point at which the harmony among the three speakers might seriously be disrupted. I am surprised, indeed, that there was not more challenge to several of Dr. Ebert's forthright statements such as: 1) "What we need is a system or systems of medical care which provide universal access to a reasonable range of medical services at a cost that can be controlled." 2) ". . . I happen to believe that the organization of health services should dictate health manpower needs rather than attempt to structure services on the basis of some predetermined formula for the production of specialists and primary care physicians." Here, Ebert opens up a serious question about the organizing principles now shaping medical education. In particular, he seems to imply the kind of articulation between education and service which those who favor community as the ordering principle deem so essential.

Ebert, however, examines this possibility and concludes firmly, "This is not something which will be accomplished by altering the medical education system." He has, however, precisely located one of the points of conceptual confrontation between the two ordering systems. Bryant, Ramalingaswami, and Fulop take the contradictory view and contend that medical education must be geared to medical care delivery systems. The deficiency in this meshing is what causes them to label the present educational patterns as "socially dysfunctional."

Without presuming to imply what the outcome should be, I would suggest that this is an excellent primary locus for the kind of serious dialectical discourse I have been proposing. The two positions cannot be simultaneously true, nor can one take dominance without some injury to the other. This is the kind of conflict which will not yield to "artful" compromise.

The proposition that medical education and the medical care system are, or are not, mutually dependent needs critical examination by proponents of both views. Demonstrative reason is of limited utility since there is little scientific evidence for either view. Dialectical reasoning, as defined earlier, is more appropriate. What reasons can be adduced for each view? What sort of evidence might be convincing? What follows if we accept one view or the other? What values are enhanced or imperiled? If there is a measure of validity in both positions, how can society be assured that both will be retained? These questions need to be addressed point by point if we are to move from simple assertions and ideological conflict to rational discourse.

Another possible locus for such discussion is Dr. Ebert's recognition of the need for wider training in decisionmaking in medical school. He feels physicians handle decisions well when dealing with individual patients, but poorly when decisions are of a broader kind involving the health care system, economics, and the like. A fuller analysis of the intellectual differences between these two kinds of decisionmaking is essential. Are the logical and epistemological bases for these types of decisions radically different? How much of each kind of training is needed for the various categories of physicians society needs? What qualities of mind are best predisposed to each? How does each type of problemsolving conform to the problems most prevalent in society today? A point-by-point analysis of these questions is indispensable in deciding what skills are to be taught and how.

There are many more assertions in each of the opposing value systems which have profound effect on what is to be taught in medical school. I have chosen a few of them merely to illustrate the central theme of my commentary--that a detailed examination of claim and counterclaim will require a challenge to the ordering principle from which they derive. The constructive mutual criticism and explication of these opposing assumptions are the most urgent needs in future discussions of medical education. Compromises internal to each system are difficult, but feasible. Those between systems are not.

Cost and Exportability of American Medical Education

Time and prudence dictate that we discuss these two topics briefly, since the points already made about selection and program are equally applicable.

With respect to cost, there is a large sector of agreement among the speakers: 1) Costs should be better understood by the public. 2) They should be shared between government and student. 3) They can be reduced by optimizing managerial efficiency. Costs, like the issues of selection and program, are finally understandable only in terms of the principles used to establish priorities. Within each system, costs can be rationalized. Between systems, the fundamental conflict reappears. Because it is a second order phenomenon, I do not think cost is a good place to initiate discussion between the two principle ordering concepts in medical education.

The central issues posed by the last three speakers have already been discussed amply. There is little need of compromise here, since agreement is so obvious and so forcefully stated. Bryant, Ramalingaswami, and Fulop pay tribute to the contributions of American medical education to the training of specialists and faculty members in the developing countries. They are fully cognizant also of the importance of scientific medicine in eradicating many socially significant diseases.

Their major themes are three: 1) Medical education must be more stringently scrutinized for its congruence with the major health needs of a nation, and it must be shaped by those needs. 2) Continued exportation of American medical educational ideals based on a scientific image of the physician causes the profession to deviate in developing countries from the major health needs of those countries. 3) Whenever Americans presume to be of assistance to other nations, we must work as colleagues, not superiors with ready answers. We must seek to know what a country feels _it_ needs rather than dictate what _we_ think it needs.

The focal contribution of these three papers is that they elaborate clearly and succinctly an ordering principle for medical education specifically and categorically opposed to the ordering principle of contemporary American medical education. The assumptions and presuppositions in both value systems are equally in need of validation and critical examination. I have concentrated on one part of the two-part dichotomy for illustrative purposes. Community as genesis for medical education is just as ideologically colored as science as genesis. Its presuppositions are equally in need of dialectical examination and criticism.

The Next Quarter Century--The Recovery of Reasoned Discourse

I would add presumption to foolhardiness were I to go much further in suggesting specific resolutions to the conflict of the organizing principles I detect in contemporary medical education. My obiter dicta have no doubt already uncovered some of my preferences. But some closing remarks on the kind of discourse required to make the opposition of organizing principles productive rather than destructive seem appropriate.

I have tried to show that the current discourse on medical education has taken on too much the character of ideological conflict and not enough that of a reasoned discourse. Two socially important conceptions of medical education are emerging, clearly in opposition to each other. Neither takes the other seriously enough to engage in critical appraisal of its presuppositions and value constructs. Yet these presuppositions, when implemented in such things as student selection and program content, can have very different implications for society.

Simple dialogue, in the distorted modern meaning of that term, is insufficient. It leads to mere sermonizing without the serious engagement of opposing ideas. It is true that the discourse between rival educational systems, like the discourse about most of the important matters in human life, stands outside the realm of demonstrative reasoning. Its starting propositions rarely have the status of scientific fact. As Wayne Booth points out in his masterful analysis of the "modern dogma," we are universally succumbing to the conviction that reasoning about nonfactual matters is fruitless. We spend most of our efforts in "passionate commitments" which had lost connection "with the provision of good reasons"(Booth 1974).

Such an attitude freezes our actions into reiterative affirmations which ignore the possibilities in the counter position. While such a static state may be permissible in matters of theory, it is unacceptable in practical human affairs where the assertions we make soon become the actions we take. There is no alternative then to the responsibility of opening and maintaining a reasoned discourse. Note, I did not say a "reasonable" discourse. There is too much of the suggestion of any easy peace and license to nonengagement in the connotations of a merely "reasonable" exchange. We must be "un-reasonable" enough to know, for example, when compromise is destructive and when not to participate simply to avoid the pain of examining our own convictions critically.

A reasoned discourse can occur in a variety of ways, all of which contain the elements of dialectical argumentation whether it follows the Aristotelian or Hegelian model or the "rhetoric of assent" which Booth proposes. A reasoned discourse between the opposing principles in medical education, to be authentic, would have to meet certain requirements which I shall only enumerate. Such a discourse must begin with a motive which transcends the immediate interest of the value systems in conflict--that is to say, it must spring from an ethical source. This means we must reflect first on the ethics of medical education--on the moral obligations educators incur by virtue of the unique positions of medical schools in society. I have attempted an initial analysis (Pellegrino, in preparation) of the socially significant ethical issues in medical education. What is surprising is how little has been written on this subject, which may explain some of the difficulties of fostering creative discourse on the whole subject of medical education.

Each organizing principle and its satellite value system must be willing to take the counterview seriously enough to examine each of its propositions, the reasons advanced for them, and the implications of putting these into action. The standard against which supporting reasons can be measured will be found in the ethical obligations of medical education to the society it serves.

No dogmatic or value statement can be taken for granted, no matter how integral it may be to our perceptions of what we think society needs, until it is shown demonstratively to have a beneficial impact, or until at least no good reason to doubt it has been advanced.

Argumentation must be dialectical in the sense we have indicated earlier--that is to say, the lack of certitude of the presuppositions must be recognized, the antithetical nature of the actions that result must be acknowledged, and a new relationship must be struck which relates the contradictory ideas to each other in constructive ways while retaining some of the essential differences.

The illusion that one organizing principle will emerge triumphant must be abandoned. Instead, we must seek the most creative form of the tension between opposing principles.

This will ordinarily mean placing science and community into a dynamic interaction with each other, allowing proponents and values of each to be expressed, because both are requisite to a sound medical care system.

To be a reasoned discourse, educated and perceptive participants outside the profession, like Messrs. Henry, Corbally, and Neal in this symposium, must play a significant role. They become the advocates for society, enunciating those values of broad human concern which must always constrain the hubris of any successful social instrument.

We must discriminate carefully between those things susceptible to artful compromise, and those susceptible only to artful confrontation and resolution through dialectical argumentation. We have given a few illustrations of how these distinctions can be made.

What we need is nothing less than a recovery of our faith in the power of reasoned discourse to deal with complex, value-laden, and opposing principles, whose practical exemplifications have so much significance for human affairs. This is a need evident also in many other domains of human intercourse in the contemporary world. Medical educators could provide a model which others might be emboldened to emulate.

There is really no alternative. America at the bicentennial can be proud of its scientific and technological achievements in medicine, and the educational system which undergirds them. But medicine and medical education both are now required to face squarely the danger to which all of man's special institutions are sooner or later subject. I refer to the danger of losing sight of their origins and purpose in social need. The greater the success, the greater the danger that these institutions will make individuals and society the tools of their own survival.

The bicentennial contribution of medical education could be its perception of the imminency of a danger which arises out of the magnitude of its successes. By recovering the power of reasoned discourse, based on the ethical obligations of medical schools, we can hope for a more effective and more human conjunction of medical knowledge and education with personal and community service.

The task for the next quarter century is to heal the widening breach created by the contrary pull of two doctrinal systems. Medicine must guard zealously against the dogmatic spirit easily engendered by its success; society must guard against the anti-intellectualism so near the surface of American life.

We need the courage to sustain challenges to our convictions, and we need the optimism in Whitehead's advice, "A clash of doctrines is not a disaster--it is an opportunity."*

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*Quoted in: W.H. Auden and Lewis Kronenberger. 1962. The Viking Book of Aphorisms. Viking: New York.

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THE CONTRIBUTORS--BIOGRAPHICAL SKETCHES

DR. **STANLEY S. BERGEN** is a graduate of Princeton University and the College of Physicians and Surgeons at Columbia. Trained in internal medicine, his interests gradually shifted to medical administration. He was for a short period Senior Vice-President for Medical and Professional Affairs of the New York City Health and Hospitals Corporation. Since 1971 he has been President of the College of Medicine and Dentistry of New Jersey.

MR. **ALTON BLAKESLEE** attended both Duke University and Columbia College. He joined the Associated Press in 1939, served on the foreign desk during the war years, and has been reporting science news since 1946. He was named science editor in 1969. Mr. Blakeslee has won numerous awards for distinguished reporting, including the American Heart Association Howard Blakeslee Award, which was named for his father, one of the earliest newspaper science specialists.

DR. **JOHN H. BRYANT** is a graduate of the University of Arizona and the College of Physicians and Surgeons at Columbia University. Trained in internal medicine at the Presbyterian Hospital in New York, and in Biochemistry at the National Institutes of Health, he served for 2 years as a special consultant to the Rockefeller Foundation in a study of auxiliary health personnel education in developing countries, then as a staff member assisting in the development of the Ramathibodi Faculty of Medicine in Bangkok. Out of these experiences came his book *Health and the Developing World*. Since 1971 he has been Director of the School of Public Health at Columbia University.

DR. **ROGER J. BULGER** is a graduate of Harvard College and Harvard Medical School. His training in general internal medicine and infectious disease was taken at the University of Washington where he remained on the faculty until 1970, serving as Medical Director of the University Hospital and Assistant Dean for Clinical Affairs. He was subsequently Associate Director of Medical Education and

Chief of the Division of Allied Health Professions at Duke University before becoming Executive Officer of the Institute of Medicine of the National Academy of Sciences. In 1976 he was appointed Chancellor of the University of Massachusetts at Worcester and Dean of the Medical School.

DR. ROBERT A. CHASE is a graduate of the University of New Hampshire and Yale University School of Medicine. Trained in surgery at Yale and the University of Pittsburgh, he served on the Yale faculty until assuming the chairmanship of the Department of Surgery at Stanford in 1963. In 1974 he was named President and Director of the National Board of Medical Examiners.

DR. JOHN E. CORBALLY is a graduate of the University of Washington, and did his doctoral work in educational administration at the University of California. He has been a high school principal and a member of the faculty of education at both the University of California and Ohio State. Since 1959 he has been an administrative officer, first at Ohio State where he rose to the position of Vice-President for Academic Affairs and Provost, then at Syracuse University where he was Chancellor and President, and currently at the University of Illinois where he has been President since 1971.

DR. ROBERT H. EBERT won both his baccalaureate and medical degrees at the University of Chicago. As a Rhodes Scholar he also won a doctorate from Oxford University. Trained in internal medicine at the Boston City Hospital, he returned to the University of Chicago faculty where he ultimately became Professor of Medicine. Later he occupied named professorships at Western Reserve University and Harvard. He was named Dean of the Harvard Medical School and President of the Harvard Medical Center in 1965. Recently he served as Vice-Chairman of the President's Biomedical Research Panel.

DR. TAMAS FULOP won his doctorate in medicine and the higher degree of Candidate of Medical Sciences (equivalent to our Ph.D.) from the University of Debrecen (Hungary). A specialist in public health administration and organization of medical care, he was appointed Professor and Head of the Department of Social Medicine at that University in 1963. For 2 years, he was also Deputy Rector in charge of teaching programs at the medical school. He has been a member of the World Health Organization

Headquarters staff since 1968, and is now Director of the Division of Health Manpower Development.

DR. ALFRED GELLHORN is a graduate of Amherst College and Washington University School of Medicine. Trained as both clinician and basic scientist, he has served in the Departments of Physiology, Pharmacology, and Medicine at Columbia University College of Physicians and Surgeons where he was for 15 years Director of the Institute of Cancer Research. He became Dean of the University of Pennsylvania School of Medicine in 1968, where he remained until 1974 when he was appointed Vice-President for Health Affairs and Director of the Center for Biomedical Education at the City College of New York. He is also President of the Council for International Organizations of Medical Science.

DR. WILLIAM J. GROVE won both baccalaureate and medical degrees from the University of Illinois, where he also took his training in surgery. He has been a member of the Department of Surgery faculty since 1951. His administrative appointments began in 1961 when he was appointed Associate Dean of the College of Medicine, then Dean, and later Executive Dean, when the College undertook a major expansion and reorganization as a regional enterprise. In 1976 he was appointed the first Vice-Chancellor for Academic Affairs at the Medical Center Campus.

MR. FRED M. HECHINGER did his undergraduate work at New York University and the City College of New York and his graduate work at the University of London. It was there that he began his work as an education writer for The Times of London. He has served as Education Editor of the Bridgeport Herald, the New York Herald Tribune, and the New York Times. He has been a member of the Editorial Board of the Times since 1969 and is now also the Assistant Editor of the Editorial Page. He is the author of three books on education, and coauthor, with his wife, of three more. He is the recipient of many awards both in this country and abroad, for his work as a journalist.

DR. DAVID DODDS HENRY did both his undergraduate and graduate work in education at Pennsylvania State University. He served on the education faculty of that institution before beginning a series of administrative appointments that brought him finally to the Presidency of the University of Illinois in 1955. These included both the

Presidency of Wayne State University and the Vice-Chancellorship at New York University. He has been President or Chairman of most of the major organizations in higher education including the Association of American Universities and the American Council on Education. Since 1971 he has been President-Emeritus of the University of Illinois. He is the recipient of 29 honorary degrees.

DR. ROBERT Q. MARSTON has since 1974 been President of the University of Florida. He is a graduate of the Virginia Military Institute, the Medical College of Virginia, and Oxford University where he was a Rhodes Scholar. He served on the faculty of the Medical College of Virginia and the University of Minnesota before becoming Dean of the Medical School and Vice-Chancellor of the Medical Center at the University of Mississippi. He was subsequently Director of the USPHS Division of Regional Medical Programs, and from 1968-1973 Director of the National Institutes of Health.

DR. GEORGE E. MILLER is a graduate of the University of Pennsylvania. Trained in internal medicine, a growing interest in the nature and process of medical education led him to embark upon a second career which attempted to bring the science of medicine and the science of education into a more intimate and functional relationship. In 1959 he came to the University of Illinois College of Medicine to establish what is now known as the Center for Educational Development and was its Director for nearly 17 years. His more recent interest in the international aspects of health professions education has resulted in his appointment as Coordinator of International Activities for the Medical Center Campus.

DR. EDMUND D. PELLEGRINO received a baccalaureate degree from St. John's University, and his medical degree from New York University. He was trained in internal medicine at Bellevue Hospital and Goldwater Hospital in New York City. After being a staff member at the Homer Folks Tuberculosis Hospital, he moved to the Hunterdon Medical Center as Director of Internal Medicine and Medical Director. Subsequently, he has served as Chairman of Medicine at the University of Kentucky, Vice-President for Health Science at SUNY Stony Brook, Chancellor of the University of Tennessee Center for the Health Sciences, and now President and Chairman of the Board of

Directors of the Yale-New Haven Medical Center. He is also editor of the Journal of Medical Education and Chairman of the Institute for Human Values in Medicine, among other appointments.

DR. V. RAMALINGASWAMI won his medical degree from Andhra University in India and a Doctor of Science degree from Oxford University. Trained in pathology he became Professor of Pathology at the All-India Institute of Medical Sciences in 1957. He has been the Director of that Institute since 1969. Dr. Ramalingaswami is well known for his experimental and clinical studies of nutritional disease. During the current year as a Visiting Scholar of the Fogarty International Center at the National Institutes of Health, he is writing a book on liver disease. A distinguished figure in international medical education he has led his country in its effort to match health manpower training to health service needs. He was recently honored by the World Health Assembly as recipient of the Leon Bernhard Foundation Award.

DR. IRVING SCHULMAN received both baccalaureate and medical degrees from New York University. He was trained in pediatrics at Bellevue Hospital and was a postdoctoral Research Fellow in Pediatrics at Cornell University Medical School. He has been a faculty member at both of these schools as well as at Northwestern University. He was Professor and Head of the Department of Pediatrics at the University of Illinois from 1961-1972, and has since that time occupied a similar position at Stanford University. He is Editor-in-Chief of Advances in Pediatrics, and Associate Editor of a standard textbook in that field.

MR. ARTHUR J. SNIDER is a graduate of the State University of Iowa and won a master's degree in science writing from Northwestern University. Originally a political reporter, he has covered the biological, medical, and physical sciences for the Chicago Daily News since 1946. He has been honored six times by the American Medical Association for the quality of his reporting, and by many other health professions organizations as well. He has been President of both the Council for the Advancement of Science Writing and the National Association of Science Writers.

MR. MARK L. SPLAINGARD originally from Collinsville, Illinois, graduated in 1973 from Trinity College in Hartford, Connecticut. He entered the University of Illinois College of Medicine in 1973 and is now a fourth-year student in the Abraham Lincoln School of Medicine. Mr. Splaingard has just returned from participating in a summer elective program in Nigeria. He will present at the symposium his prize-winning essay "Who Should Pay for Medical Education?"